Steam Humidifier

SK300 Series BACnet

Installation Instructions and User Manual

C US

Foreword

Neptronic Company Overview

Founded in 1976, we're a private corporation that designs, manufactures and distributes products for the HVAC industry. Our product line includes intelligent controllers, electronic actuators, actuated valves, humidifiers and electric heaters.

Our products are designed and manufactured by over 250 dedicated employees in our 7,500 m^2 (80,000 ft^2) state-of-the-art facility located in Montreal, Canada. Using a vertical integration model, our entire manufacturing chain is under one roof from software and hardware development, to SMT circuit board assembly, to sheet metal fabrication, to product testing ensuring that our products are engineered to last.

We currently hold several national and international patents and with our continued commitment to research and development, we provide innovative products and technologies for the ever-evolving challenges of the HVAC industry. Exporting over 70% of our sales, we have an exclusive distribution network around the globe that provides comprehensive solutions to our worldwide customers.

About the Manual

These installation and operation instructions have been developed to facilitate the installation of the Steam Humidifier.

- The strict application of these instructions will ensure the conformity of your installation and operation as per the manufacturer's recommendations.
- The application of these instructions is one of the conditions for the application of the warranty.
- The application of these instructions does not ensure, at any time conformity to procedures, regulation or local codes, regarding electric installation and connection to local water supply.

This product has been declared to conform to the applicable Canadian and American safety standards and directives and bear the CSA (c) & (us) mark. The Certificate of Conformity, CSA is available, upon request with the manufacturer.

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Electricity

All work concerned with electrical installation MUST only be performed by skilled and qualified technical personnel such as an electrician or a technician with appropriate training). The customer is always responsible for ensuring the suitability of the technical personnel.

Please observe the local regulations concerning the provision of electrical installations.

Correct Use

Neptronic systems and its products are designed only for humidification use. Any other application is not considered appropriate for the intended purpose. The manufacturer cannot be made liable for any damage resulting from incorrect use.

General Warranty

To view the complete Neptronic General Conditions of Sale and Warranty, go to www.neptronic.com/Sales-Conditions.

Handling and Lifting

Lifting or handling MUST be carried out by trained and qualified personnel. Ensure that the lifting operation has been properly planned, assessed for risk and that the equipment has been checked by a competent Health & Safety representative, and effective control measures are in place.

It is the customer's responsibility to ensure that the operators are trained in handling heavy goods and to enforce the relevant lifting regulations.

The Steam Humidifier MUST always be handled and lifted with care and should remain in its original packaging for as long as possible prior to installation.

The Steam Humidifier package may be carried using a forklift from the underside. Caution should be exercised to ensure balanced load before lifting.

Unpacking

The Steam Humidifier is shipped inside carton boxes or in a wooden crate. Remove packing and skids prior to commissioning.

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Overview

List of Accessories Supplied

The following accessories are supplied with the SK300 Steam Humidifier:

- 2 sets of keys.
- 2 adjustable collars for the connection of the steam hose for each steam output.
- 1 female compression fitting ¾ (19mm) hydraulic for the drain output of the evaporation chamber.
- 1 female compression fitting ½ (13mm) hydraulic for the drain output of the drip pan.
- 1 female fitting and a braided hose for the water supply connection.
- 1 Installation Instructions and User Manual.

Visual Overview

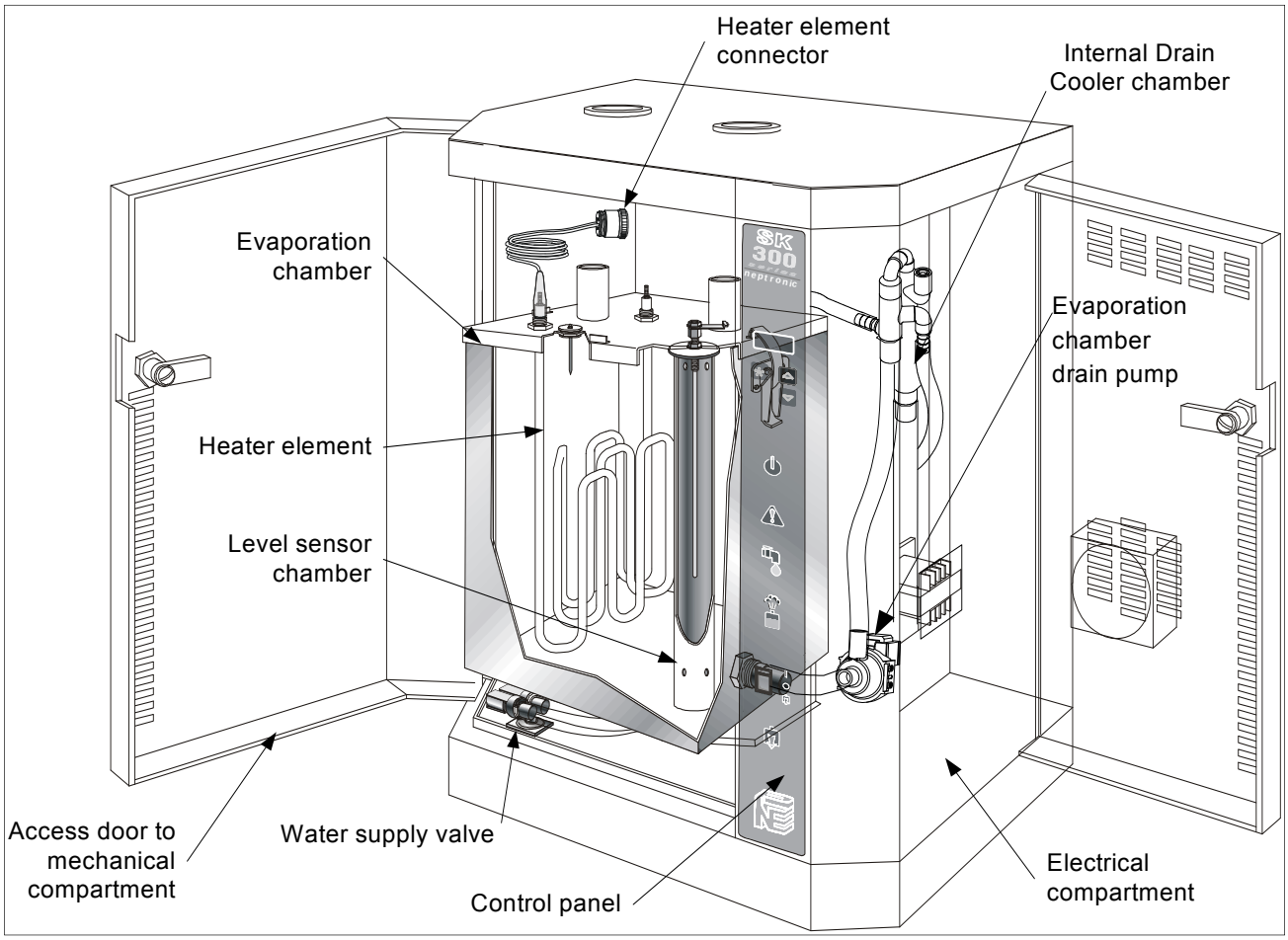


Illustration 1 - Overview of the Humidifier

Available Options

The following options are available when purchasing a SK300 humidifier:

Model	Description
Suffix M (SK320M)	Modulating control humidifier
SF DI-APPLICATION	Humidifier for a system supplied with Deionised water or Reverse Osmosis water, dissolved solids more than 1 ppm
SF ULTRAPURE-DI	Humidifier for a system supplied with Deionised water or Reverse Osmosis water, dissolved solids more than 0.028 ppm
SDU-REM	Space Distribution Unit mounted on humidifier (SDU) or remote installation
Suffix B (SK320M-600-3B)	Network Communication System - BACnet
SK320M-600-3P	Stainless steel humidifier cabinet
SF SK300 FANRELAY	Dry contact to activate an external fan relay on a call for humidity

BACnet Network Communication Options

The SK300 humidifier series is available with the BACnet communication module. The following options are available with the BACnet network communication model.

- Humidity demand (0 to 100%R.H.)
- Room and duct humidity (0 to 100%R.H.)
- Drain and service delay
- PID adjustment
- Setpoint adjustment
- Humidity and temperature offset
- Lock On capacity adjustment
- Actual operating status
- Alarm indications

For additional information, see the BACnet Communication Module User Guide at www.neptronic.com.

Description of Components

- *Evaporation Chamber*. Assembly includes a metal cylinder and a cover equipped with one or several heater elements. It is the most important part of the humidifier, which produces the steam.
- *Space Distribution Unit (SDU)*. Integrated steam distribution unit, optional on certain humidifiers.
- *Multi-Steam System*. Custom made system for steam distribution. This system is designed to allow very short absorption distances (less than 3 feet or 900mm) applications.
- *Steam Absorption Manifold (S.A.M.)*. Steam manifold adapted to air duct size, allows steam absorption in relatively short distance (less than 5 feet or 1500mm) applications.
- *Steam Absorption Manifold with 2 Eyelets (S.A.M.E2)*. Steam manifold with two eyelets, adapted to applications with restricted air duct dimensions that allow steam absorption in relatively short distance (less than 5 feet or 1500mm) applications.

Humidifier with Space Distribution Unit

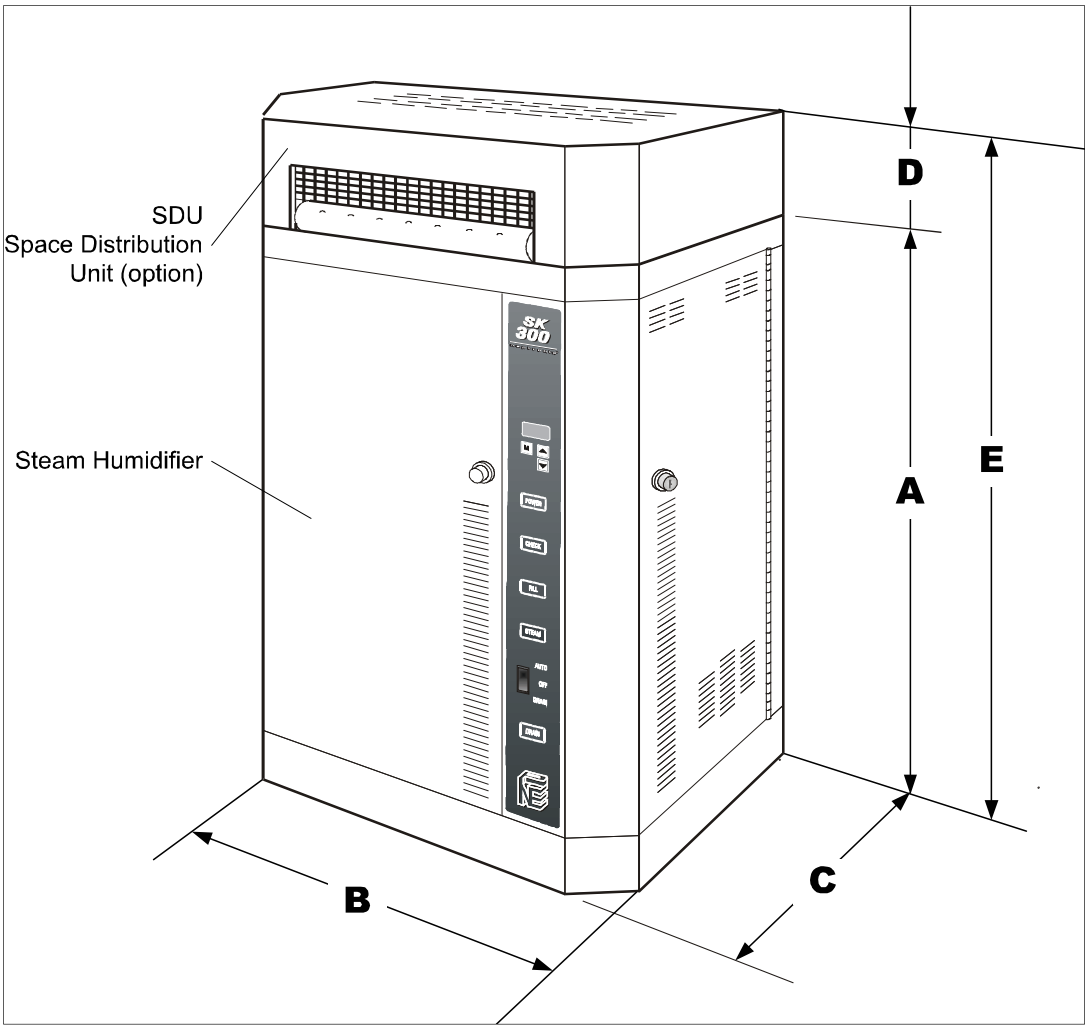


Illustration 2 - Steam Humidifier with Space Distribution Unit

Dimensions and Weight

Table 1 - Dimensions and Weight of SDU

Model	Dimensions of the Cabinet inch (mm)							SDU lb (kg)
	A	B	C	D	E	Weight lb (kg)		
						Empty	Full	
SK302 SK304 SK306	23 ½ (597)	18 ½ (470)	11 ½ (292)	5 ⅝ (140)	29 ⅛ (737)	44 (20)	57 (26)	**SDU-1** 20 (9)
SK310 SK314	28 ½ (724)	21 (533)	12 ½ (318)	6 ⅝ (165)	35 ⅛ (890)	66 (30)	115 (52)	**SDU-2** 25 (11)
SK320 SK330	28 ½ (724)	21 (533)	12 ½ (318)	12 ⅞ (324)	41 ⅜ (1048)	66 (30)	115 (52)	**SDU-3** 45 (20)
SK340 SK360	31 ¼ (794)	32 (813)	12 ½ (318)	-	-	110 (50)	205 (93)	-

Weather Proof Enclosure

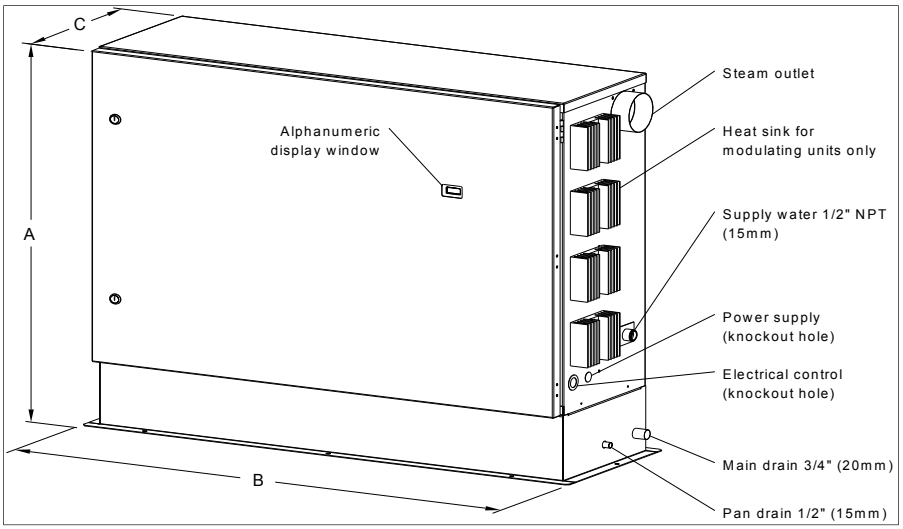


Illustration 3 - Weather Proof Enclosure

Weather Proof Enclosure - Dimensions and Weight

Table 2 - Weather Proof Enclosure: Dimensions and Weight

Model	Dimensions of the Cabinet inch (mm)				
	A	B	C	Weight lb (kg)	
				Empty	Full
SK302 SK304 SK306	28.5 (724)	25.8 (655)	11.3 (287)	66 (30)	79 (36)
SK310 SK314 SK320 SK330	34.5 (876)	29.8 (757)	13.3 (338)	95 (43)	144 (65)
SK340 SK360	34.5 (876)	40.8 (1036)	13.3 (338)	165 (75)	260 (118)

Output and Power Consumption - Humidifier

Table 3 - Output and Power Consumption

Model	Steam	Consumption								Steam Output	
	Capacity lb/hr (kg/hr)	Power (KW)	Amperage (A)							Qty	Diameter inch (mm)
			240/1	208/1	208/3	480/1	480/3	600/1	600/3		
SK302	6 (2.7)	2	8.5	10	-	4.5	-	3.5	-	1	1 ⅜ (35)
SK304	12 (5.5)	4	17	19	11.5	8.5	5	7	4	1	1 ⅜ (35)
SK306	18 (8)	6	26	30	16.5	13	7.2	10.5	6	1	1 ⅜ (35)
SK310	30 (14)	10	-	-	28	-	12	-	10	1	1 ⅜ (35)
SK314	40 (19)	13.5	-	-	38	-	16.5	-	13.5	1	1 ⅜ (35)
SK320	60 (28)	20	-	-	*	-	25	-	20	2	1 ⅜ (35)
SK330	90 (41)	30	-	-	-	-	36	-	30	2	1 ⅜ (35)
SK340	120 (56)	40	-	-	*	-	50	-	40	2	2 ⅛ (54)
SK360	180 (82)	60	-	-	-	-	72	-	60	3	2 ⅛ (54)

* Available, consult factory.

Note: Program maximum steam output using the Lock On function in Program Mode on Modulating Humidifier.

WARNING: For Modulating Humidifier, maintain the maximum power of the electrical installations according to the information in the Table 3 - Output and Power Consumption.

Do not consider a possible reduction of steam output due to modulation.

Mechanical Installation

General Recommendations

WARNING: Risk of electric shock. Disconnect the appliance from electric supply before commencing installation.

Note: Mechanical installation should conform to local codes and regulations.

Location

WARNING: The SK300 series humidifiers are designed for indoor installation only. For outdoor installation, the SK300 must be installed using a Neptronic weather-proof enclosure (see Positioning and Mounting – Weather Proof Enclosure Unit on page 7). Failure to follow these guidelines will void the warranty.

Consider the following points before deciding the location for the SK300 Steam Humidifier:

- Plan a location that is easy to access and permits an easy inspection and servicing of the humidifier.
- Do not install the humidifier where failure of the appliance could cause damage to the building structure or to other expensive equipment.
- The location should be well ventilated and the ambient temperature should not exceed 30°C (85°F).
- Consider the total steam line length between the humidifier and the steam distributor based on the steam line material type:
  - For flexible steam hose, total steam line should not exceed 16 feet (5 meters). For longer distances, use insulated hard piping.
  - For insulated hard piping, the total steam line is determined by the humidifier capacity: one equivalent foot for each lb/h capacity of the humidifier (0.67m for each kg/h), with a maximum of 50 feet (15m). For longer steam line runs, consult factory.

Positioning

- The front panel and the right side (electrical compartment) should be accessible in order to permit servicing.
- Leave a clearance of at least 48” (1.25m) to the front panel and 24” (0.6m) to the right side.
- Mount the humidifier at a minimum height of 39” (1m) to 48” (1.2m) above floor level.
- Leave a clearance of at least 10” (0.25m) under the humidifier for installation of water supply, drain piping, and electrical connections.

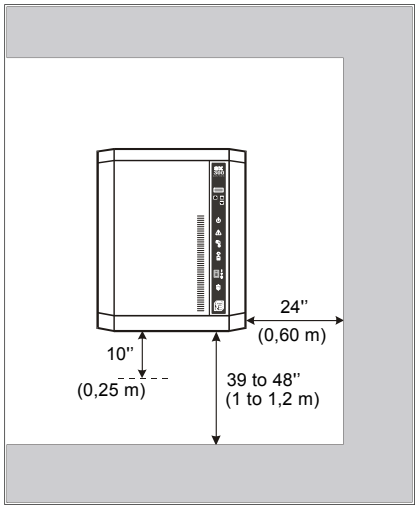


Illustration 4 - Positioning the Humidifier

Wall Mounting

Caution: Risk of malfunction. The humidifier must be placed at an equal level.

Caution: Risk of overheating. Do not block the ventilation openings located on the top, front, sides, and rear of the cabinet.

Check the strength of the chosen support or wall (bricks, concrete, stud partition wall) on which the humidifier will be mounted. See the Dimensions and Weight section to know the weight of the unit.

- Use the keyholes located on the back panel of the humidifier.
- Before proceeding to perform the wall mounting, take off the Evaporation Chamber sub-assembly (see Service section).
- Drill holes for the upper anchors (holes with eyelet) into the support or wall as per dimensions specified in Table 4 - Dimensions for Drilling Holes.
- The holes dimensions (diameter and depth) should by in accordance with the recommendations of the chosen anchors.

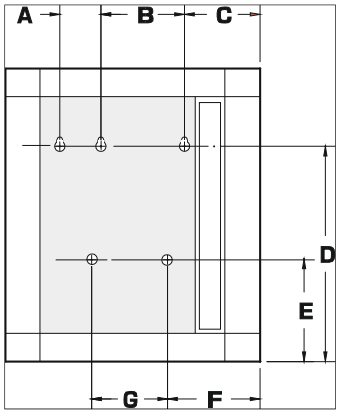


Table 4 - Dimensions for Drilling Holes

Model	Dimensions in inches (mm)						
	A	B	C	D	E	F	G
SK302 SK304 SK306	-	8 (202)	5 3/16 (165)	19 ¾ (516)	-	-	-
SK310 SK314 SK320 SK330	-	10 (254)	8 (203)	24 ⅝ (625)	11 (276)	8 (203)	10 (254)
SK340 SK360	4 (102)	12 (305)	10 ½ (265)	27 ½ (698)	11 (276)	22 43/64 (576)	-

- Install bolt anchors, if required.
- Screw-on the 2 or 3 upper screws (holes with eyelet) of a minimum diameter of #10 (6mm) (screws are not supplied).
- Leave a clearance between head screws and the wall, in order to permit the mounting of the humidifier.
- Use the keyholes located on the back panel of the humidifier.
- Hang the humidifier on 2 or 3 screws. It is preferable to keep the front door open during this operation.

  Based on the size and weight of the humidifier, you may need the help of another person.
- When the humidifier is positioned on the upper screws, tighten the screws to secure the humidifier.
- If applicable, install and secure lower screws.

Positioning and Mounting – Weather Proof Enclosure Unit

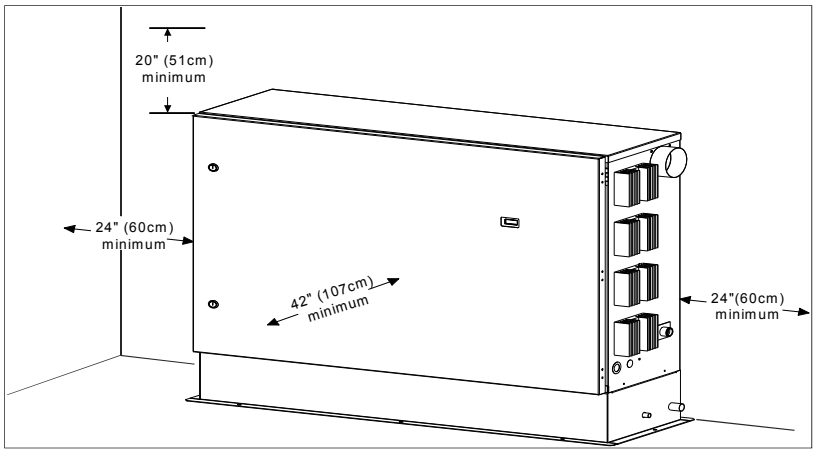


Illustration 5 - Weather Proof Enclosure Unit

General Recommendations

- Plan a location that is easy to access and permits an easy inspection and servicing of the humidifier.
- Do not install the humidifier where failure of the appliance could cause damage to the building structure or to other expensive equipment.
- Maintain the following minimum clearances while installing to enable access for inspection and servicing.

Side	Minimum Clearance
Top	20'' (51 cm)
Both sides	24'' (60 cm)
Front	42'' (107 cm)

- The humidifier is designed to be installed directly on the floor/roof or a curb.
- Provide a level, solid foundation for the humidifier.
- Ensure that the floor/roof beneath the humidifier is water proof to withstand any water spillage during servicing or if a problem occurs.
- Attach the SK enclosure securely and safely.

Steam Dispersion System

Steam Dispersion System Selection

In order to prevent the accumulation of condensation in air ducts, Neptronic has designed four basic configurations of steam distribution systems to provide you with the most economical solution for any particular application.

Steam Absorption Manifold (S.A.M) Horizontal Duct

The S.A.M system is suitable for installations where absorption distances are short, less than 5 feet (1500mm), and/or low duct temperatures are in effect.

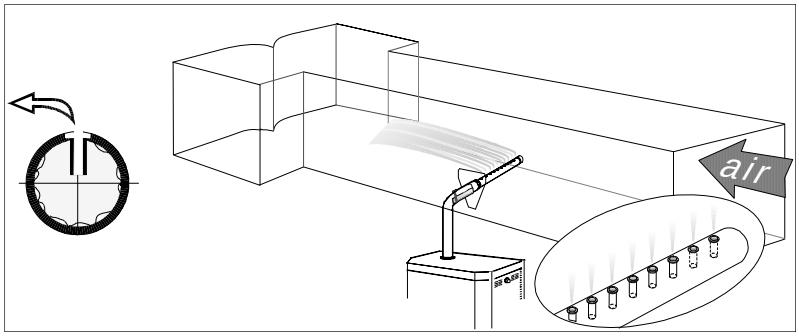


Illustration 6 - Steam Absorption Manifold (S.A.M) Horizontal Duct

Steam Absorption Manifold (S.A.M.E2) Horizontal Duct

The S.A.M.E2 system is suitable for installations where absorption distances are short, less than 5 feet (1500mm) and/or low duct temperatures are in effect. SAME2 are used in applications with restricted duct dimensions.

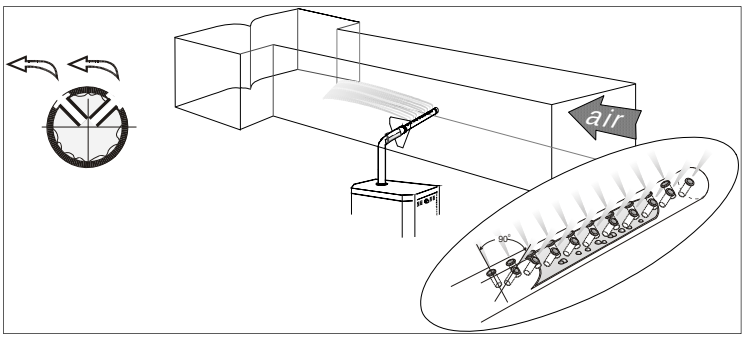


Illustration 7 - Steam Absorption Manifold (S.A.M.E2) Horizontal Duct

Steam Absorption Manifold (S.A.M. or S.A.M.E2) Vertical Duct

S.A.M or S.A.M.E2 systems for vertical ducts are used where the absorption distances are normal and the requirement is for an economical and efficient solution.

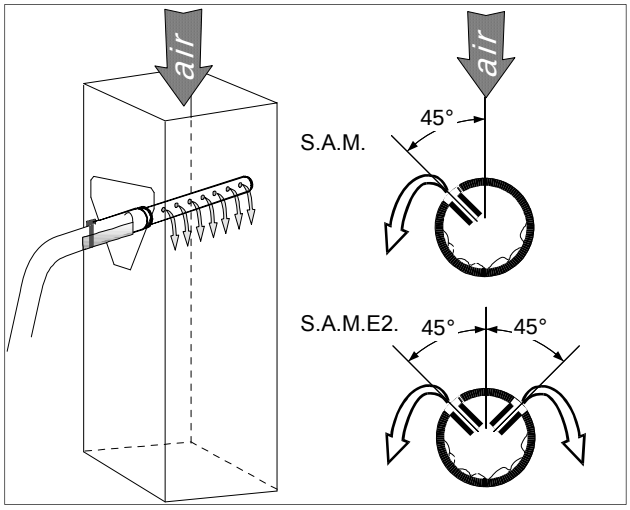


Illustration 8 - Steam Absorption Manifold (S.A.M. or S.A.M.E2) Vertical Duct

Multi Steam System

The Multi-Steam system should be installed in critical locations in air handling systems, particularly where absorption distances are very short, less than 3 feet (900mm), or low air duct temperatures are in effect. The Multi-Steam is custom made to the dimensions of duct or AHU.

Instructions to install Multi-Steam system are described in a specific installation instructions manual enclosed with the Multi-Steam system.

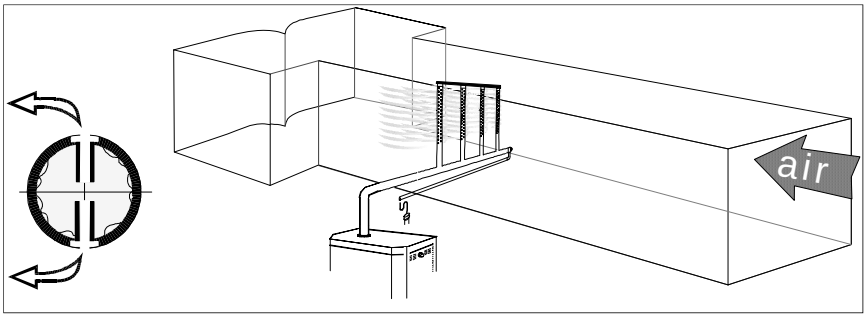


Illustration 9 - Multi Steam System

Positioning S.A.M and S.A.M.E2

Duct Mounting

Steam manifold should be mounted and secured through the side of the air handling unit or duct. Provision should be made for safe accessibility, ideally with an observation light and window. Ensure that the construction of the duct wall is suitable enough to support the steam pipe for the duration of the installation life.

Dimension of hole size in the duct must be as follows:

Steam Manifold Ø	Hole Size ØA
1 ⅜" (35mm)	2" (51mm)
2 ⅛" (51mm)	3" (78mm)

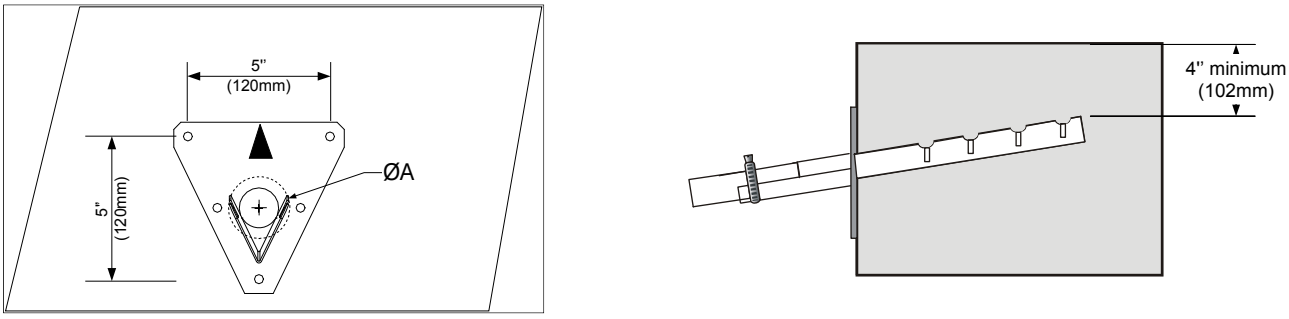


Illustration 10 - Duct Hole Dimensions and Minimum Distance

WARNING: Risk of condensing. Ensure that the minimum distance at the end of the manifold is at least 4" (102mm) from the top of the duct.

Recommendation for S.A.M Distribution Pipes

Table 5 - Recommendation for S.A.M Distribution Pipes

Model	Max Capacity		Outlet		Distribution Pipes		Max Static Pressure	
	lb/hr	kg/hr	Qty	Diameter in (mm)	Min Length in (mm)	Max Length in (mm)	in. of water	(Pa)
SK302	6	2.7	1	1 ⅜ (35)	12 (300)	24 (600)	5	1245
SK304	12	5.5						
SK306	18	8						
SK310	30	14			24 (600)	48 (1200)		
SK314	40	19						
SK320	60	28	2					
SK330	90	41			32 (750)	64 (1500)		
SK340	120	56		2 ⅛ (51)				
SK360	180	82	3					

For higher static pressure, contact the manufacturer.

Placement of Steam Pipe in Horizontal Duct

1 ⅜'' (35mm) Diameter Pipe

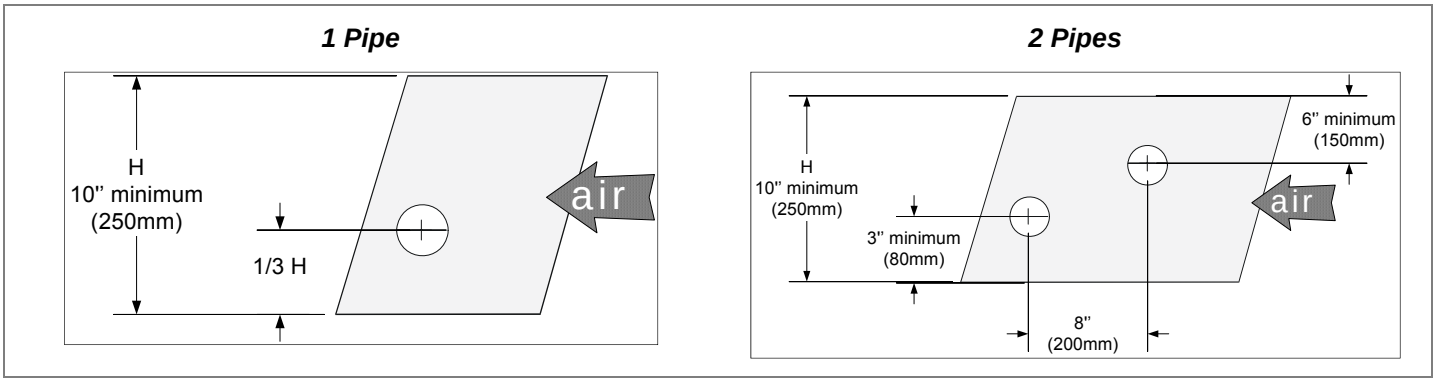


Illustration 11 - 1 ⅜'' (35mm) Diameter Pipe Placement: Horizontal Duct

2 ⅛'' (51mm) Diameter Pipe

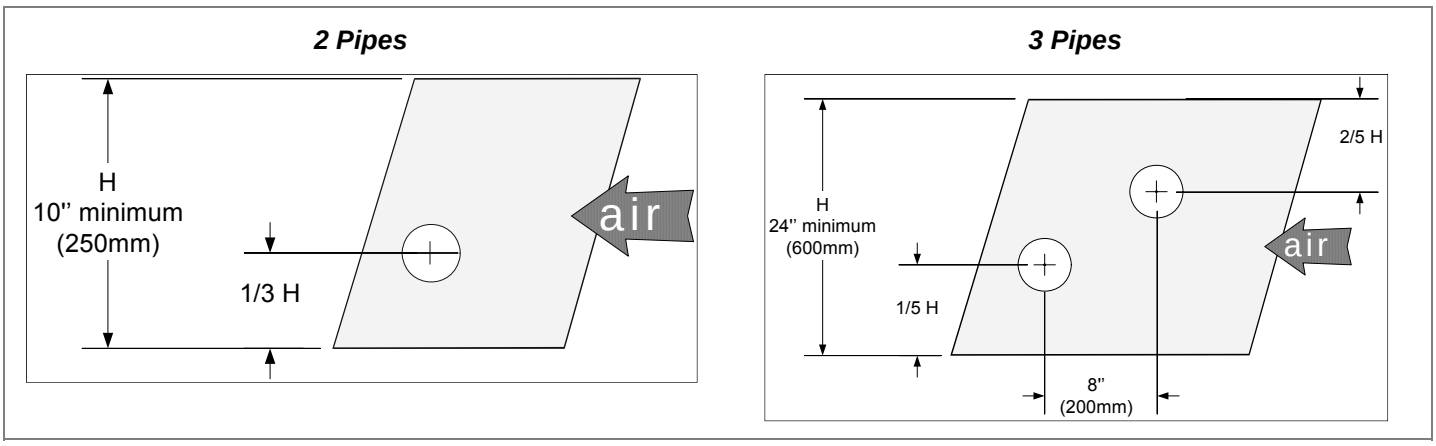


Illustration 12 - 2 ⅛'' (51mm) Diameter Pipe Placement: Horizontal Duct

Note: 2 ⅛'' (51mm) steam pipe must be supported on the end by appropriate duct hanger or strap (supplied by others).

Placement of Steam Pipe in Vertical Duct

Eyelet Orientation

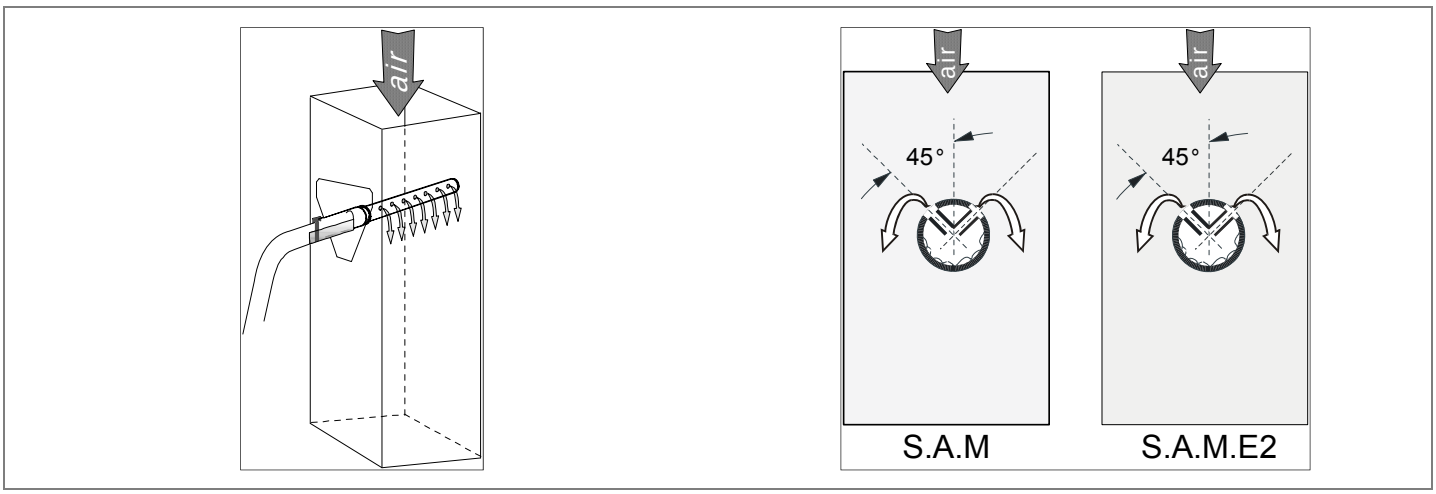


Illustration 13 - Eyelet Orientation

1 ⅜'' (35mm) Diameter Pipe

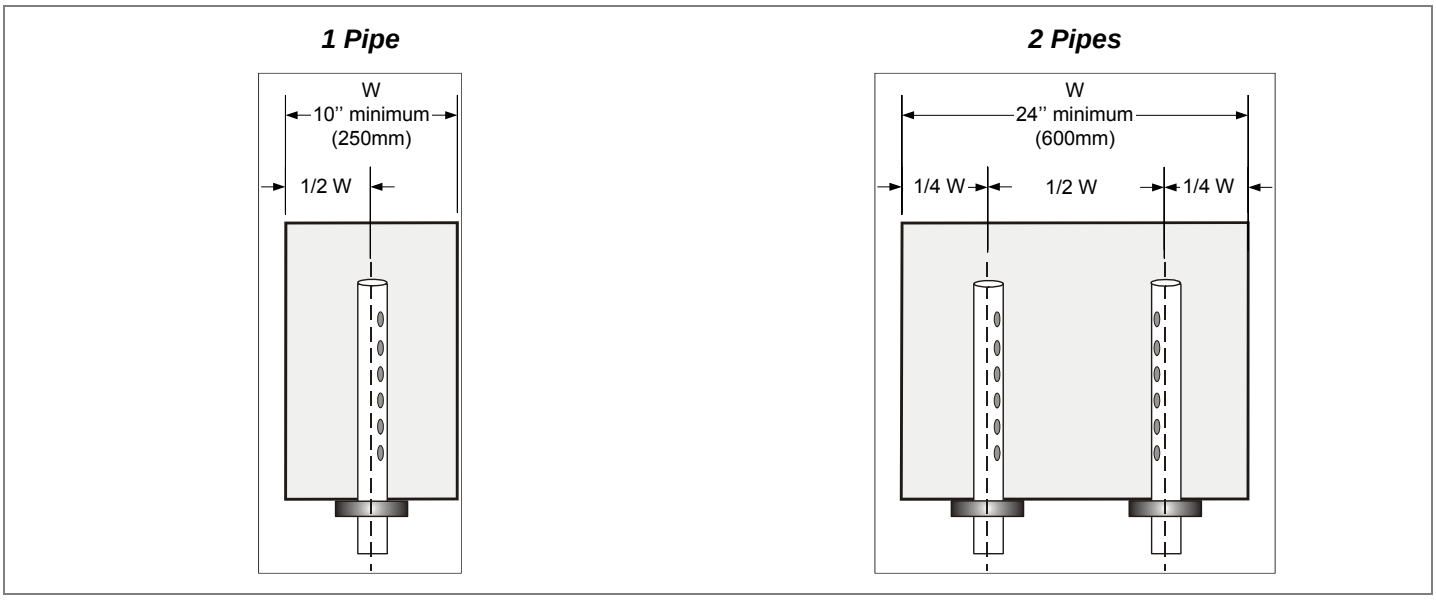


Illustration 14 - 1 ⅜'' (35mm) Diameter Pipe Placement: Vertical Duct

2 ⅛'' (51mm) Diameter Pipe

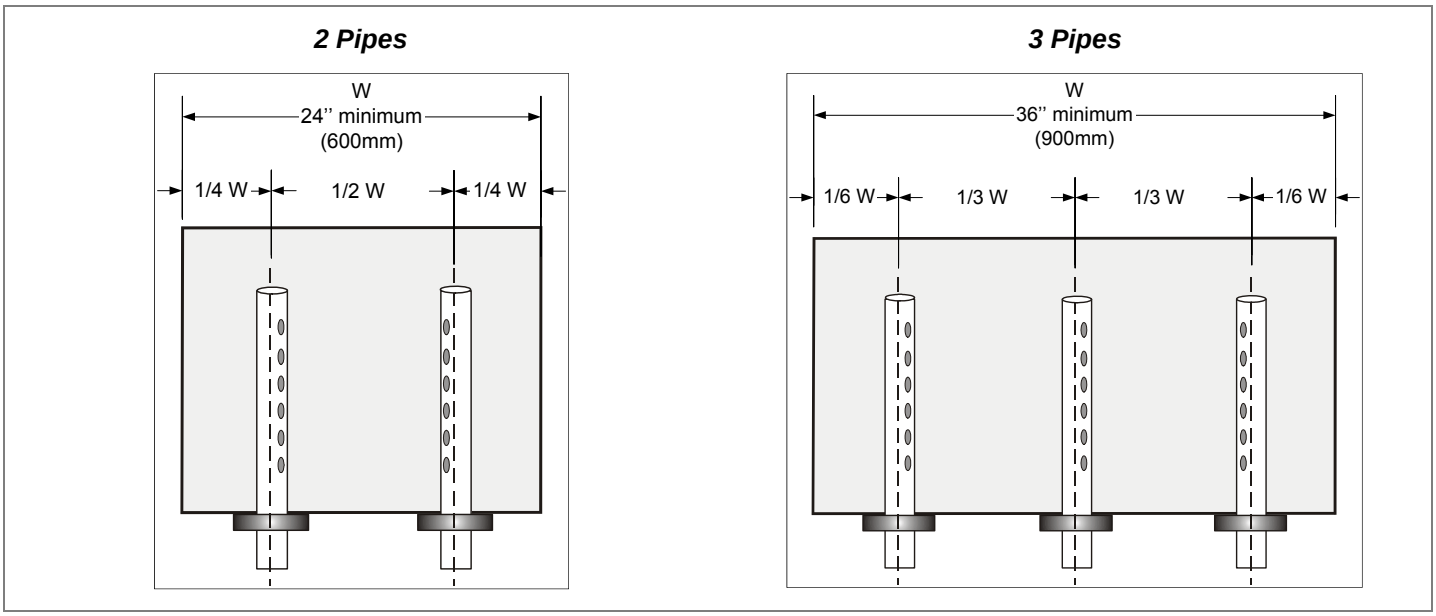


Illustration 15 - 2 ⅛'' (51mm) Diameter Pipe Placement: Vertical Duct

Steam Output Connections

Installation

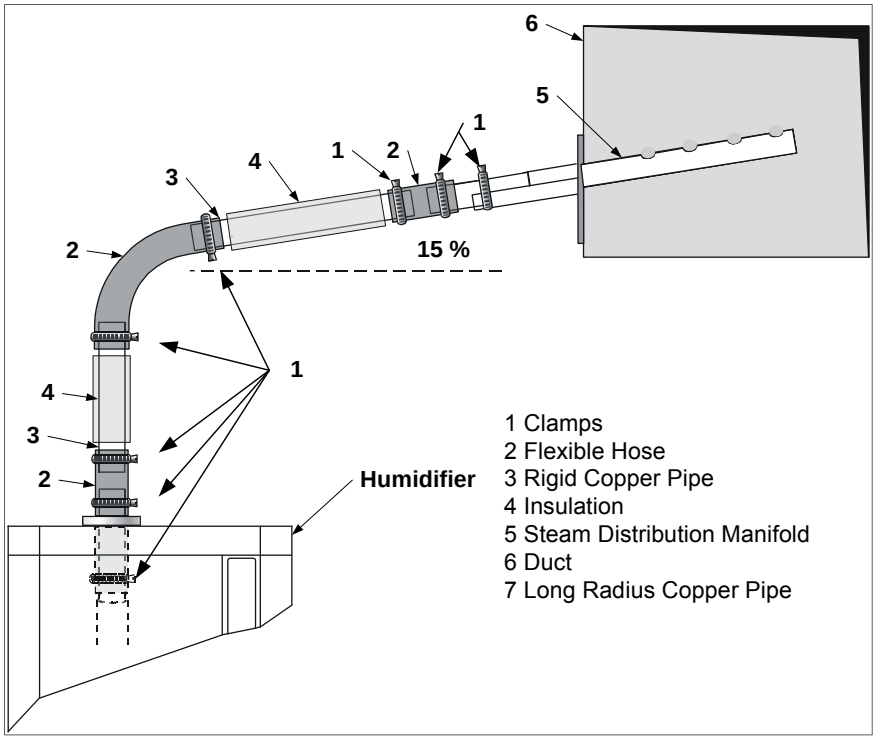


Illustration 16 - Steam Output Connections: Typical Installation

General Recommendations

Follow these general installation rules in order to avoid any condensation accumulation, which can cause severe water accumulation in the duct or a humidifier malfunction.

Caution: Risk of malfunction. Avoid kinks, sags, and areas where condensate can be trapped.

- The slope of the steam hose (rigid or flexible) should not be less than 15% (7 horizontal lengths for 1 vertical length) in order to ensure continuous drainage of condensation back to humidifier or to a steam trap.
- The lowest point of any steam hose or rigid pipe must be the humidifier. If the humidifier cannot be the lowest point of the piping, install a steam trap(s) (S Type) at the lowest point(s) of the steam supply piping. The steam separator (S trap) should be installed higher than the static pressure of the system by at least 2” (51 mm).

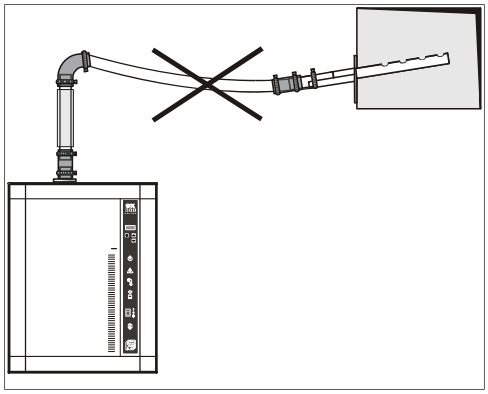
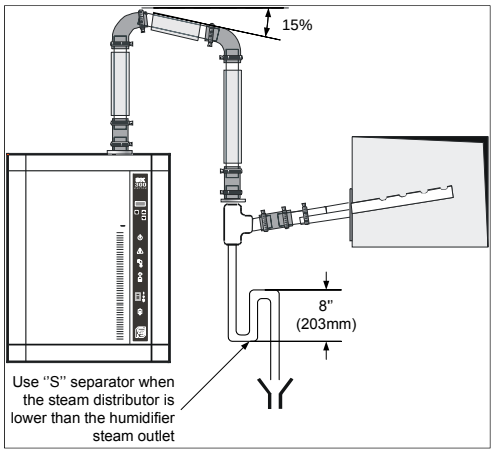


Illustration 17 - Steam Output Connection: Incorrect Installation



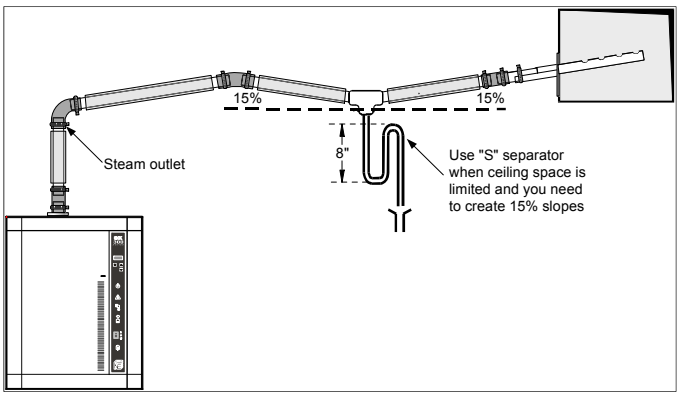


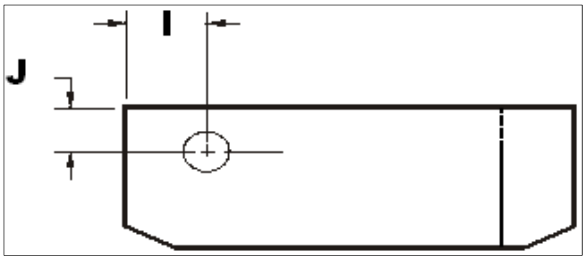
Illustration 18 - Steam Separator (S trap) Installation

- The total length of the steam hose or rigid pipe should not exceed 16 feet (5 meters). Longer runs will result in added condensation losses and may result in system malfunction. Whenever possible, use insulated copper piping. Flexible steam hose should be used for short runs (up to 16 feet or 5 meters) or for interconnecting between the rigid pipes.
- If you are using a rigid copper pipe, use insulation to diminish condensate build-up.

Position of Steam Output

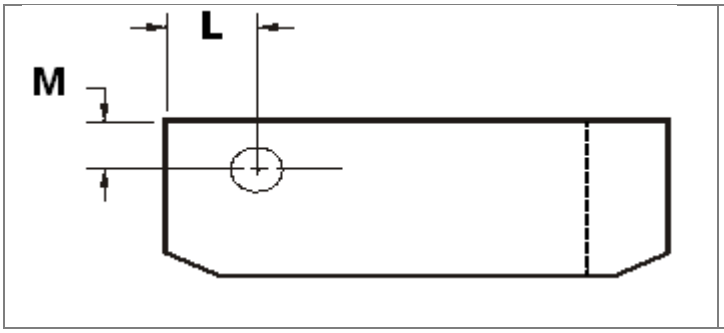
Small Cabinet

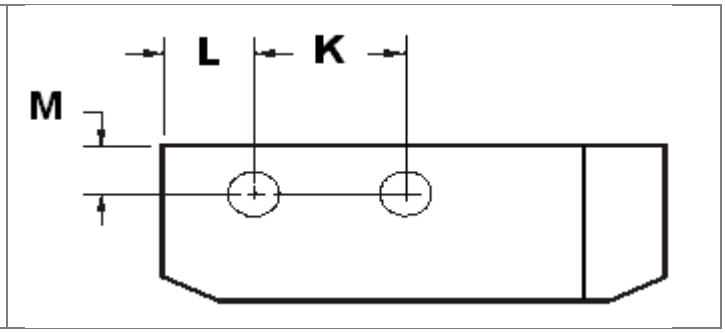
Models	I	J
SK302 SK304 SK306	4 5/16 (110)	4 13/16 (122)



Medium Cabinet

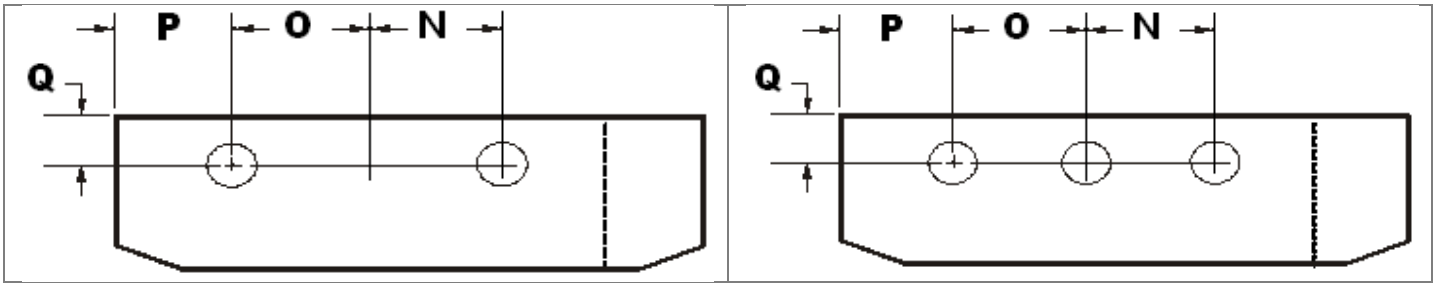
Models	K	L	M
SK310 SK314	-	4 (102)	5 5/8 (143)
SK320 SK330	5 9/32 (134)	4 (102)	5 5/8 (143)





Large Cabinet

Models	N	O	P	Q
SK340 SK360	7 (179)	7 (179)	5 3/16 (132)	5 11/16 (144)



Installation - Humidifier with SDU

- The SDU should be installed in an environment where the air is relatively clean. This will avoid the blower from getting clogged with dust.
- The humidifier should be mounted such that the SDU fan section is at least 78” (2 meters) above the floor.
- A minimum clearance of 18” (0.45 meters) from the ceiling should be allocated to avoid ceiling and wall condensation.
- If additional ventilation is not present, the fan should have a clearance from the ceiling of at least 54” (1.35 meters). Proper ventilation must be observed to avoid ceiling and wall condensation.

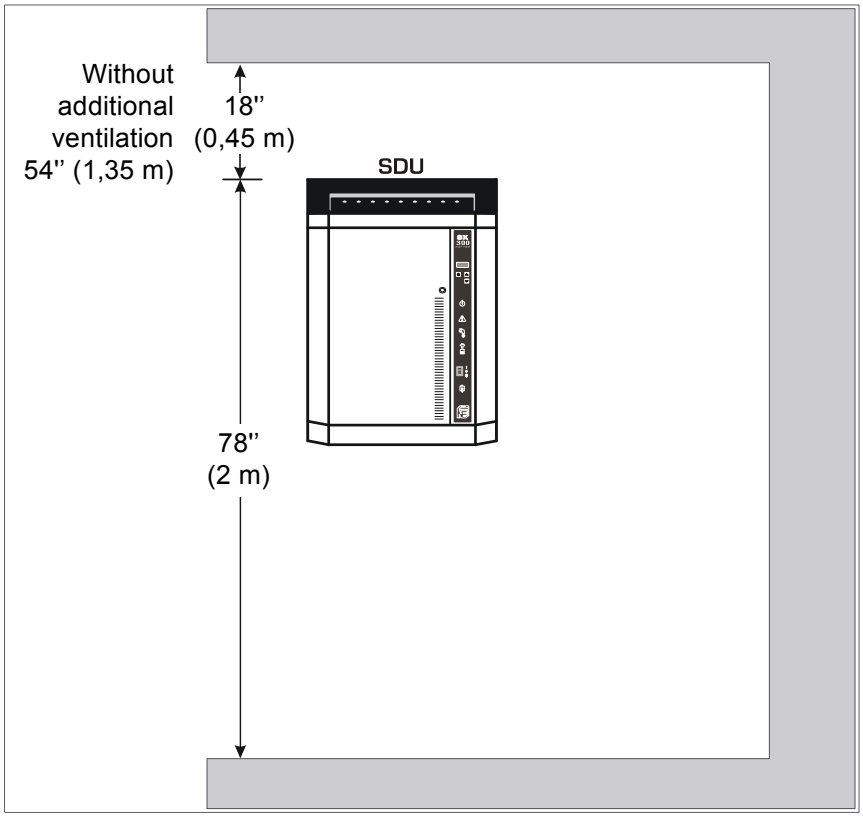


Illustration 19 - SDU mounted on Humidifier

Remote Installation of SDU

The SDU can be installed in a different location from the humidifier (remote SDU). Follow the piping recommendations.

- Mount the SDU to the wall on brackets (not supplied); do not drill mounting holes through the cabinet of the SDU.
- Connect the steam hose(s) to the bottom inlet(s) of the SDU to the top of the steam outlet(s) of the humidifier.
- Secure the hose(s) with the supplied hose clamp.
- Connect the condensate hose to the bottom of the SDU to an open drain.
- Connect the electrical wires from the SDU to the top of the humidifier. Field wiring must conform to local codes.
- The fan of the SDU will operate for a period of four minutes after steam production has stopped to prevent condensation.
- Avoid any obstruction of the ventilation openings on top of the SDU.

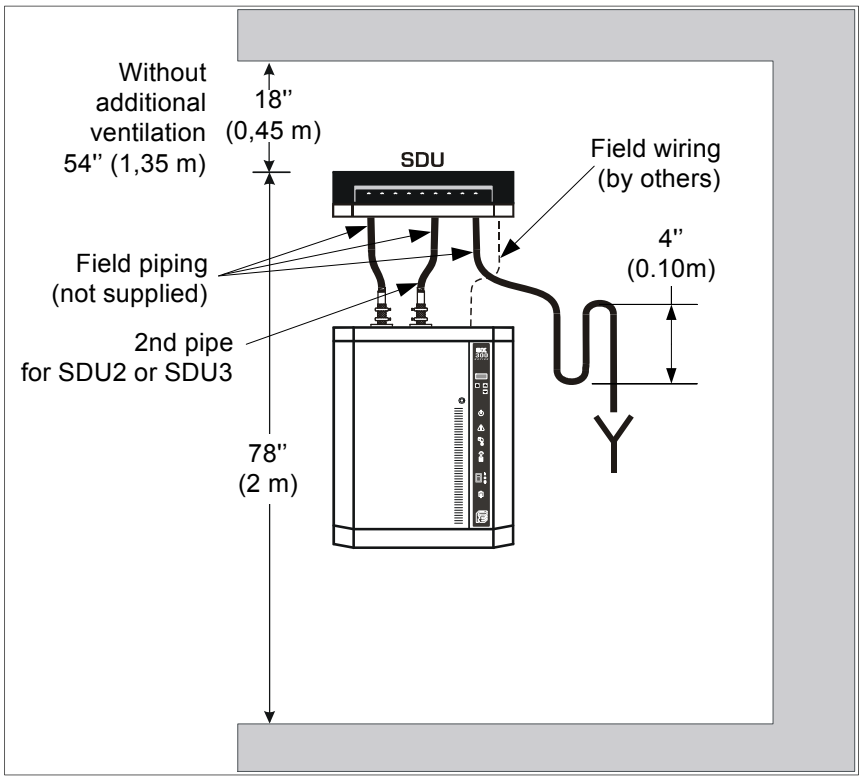


Illustration 20 - SDU Remote Installation

Maintenance of the SDU

Clean the blower if there is an accumulation of dust.

Plumbing Connections

Plumbing Installation should conform to Local and National Codes.
Any installation work must be carried out by suitably qualified personnel.

The SK300 humidifier can operate with soft or hard water. Therefore, for normal operation, pre-treatment of water is not necessary.

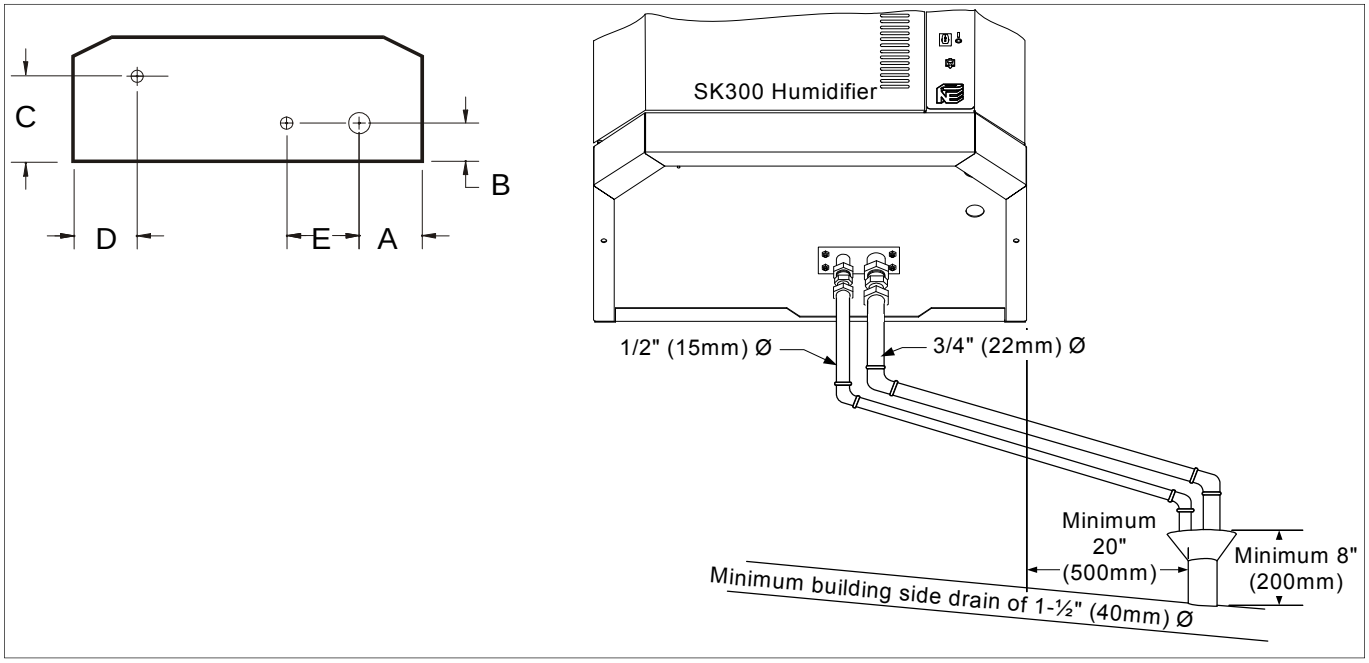


Illustration 21 - Plumbing Connections

Table 6 - Dimensions for Plumbing Connection

Model	Dimensions inches (mm)				
	A	B	C	D	E
SK302 SK304 SK306	6 ½ (165)	2 (51)	9 ⅛ (232)	4 ⅛ (105)	1 ¾ (44)
SK310 SK314 SK320 SK330	7 ¼ (184)	1 ¾ (44)	9 ¾ (248)	4 ⅛ (105)	1 ¾ (44)
SK340 SK360	7 (179)	1 ¾ (44)	9 ¾ (248)	4 ⅛ (105)	1 ¾ (44)

Water Supply

- Water Inlet Specifications
  - Inlet water pressure: 10 to 70 psig (0.7 to 4.8 bars)
  - Maximum temperature: 85°F (30°C) maximum
  - 3/8" standard copper water line connection
- A shutoff valve (not supplied) should be installed in the water supply line close to the humidifier to facilitate servicing.
- It is recommended to install a standard water strainer in the water supply line.

Water Connections

Follow the steps below:

1. Connect 3/8" (10mm) copper pipe to the bottom 3/8" (10mm) compression fitting (supplied).
2. Place the swivel top 3/4" (10mm) fitting to the male threaded part of the valve and tighten it with fingers.

Caution: Risk of damage to the valve. Do not use wrench to tighten swivel.

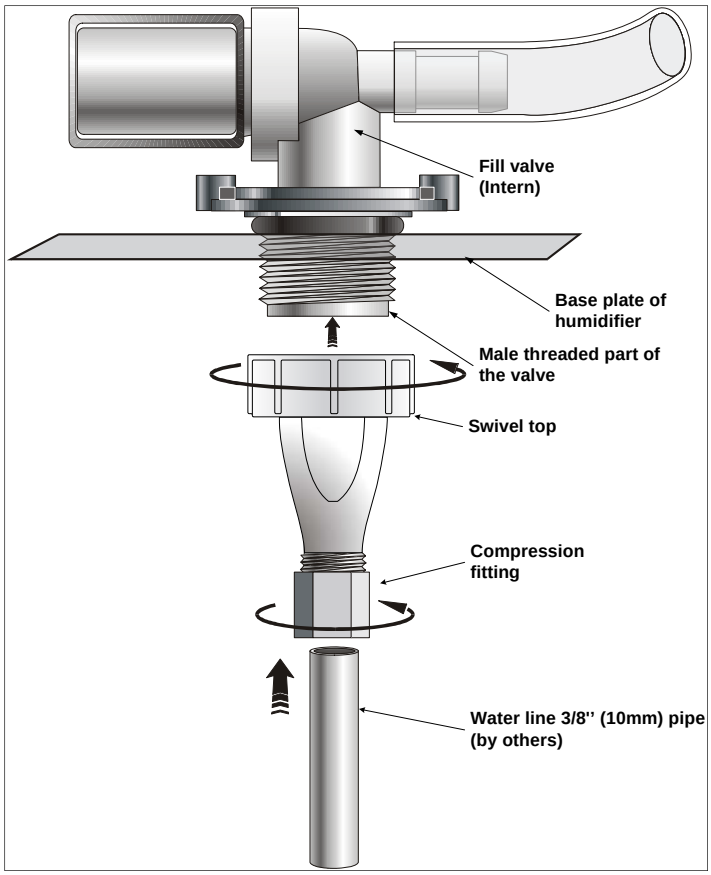


Illustration 22 - Water Supply Connections

Drain Connections

- Evaporation chamber water drain temperature: 140°F (60°C).
- Standard hydraulic compression fittings: a ¾" (evaporation chamber drain) and a ½" (Pan drain).
- 2 hydraulic pipes located under the humidifier (see Illustration 21 - Plumbing Connections) must be connected to the drain pipe.
- Use standard copper hydraulic pipes ¾" and ½".
- Ensure that the drain pipe dimension is sufficient, especially if more than one humidifier is evacuating into the same drain line.

Weather Proof Enclosure Plumbing Connection

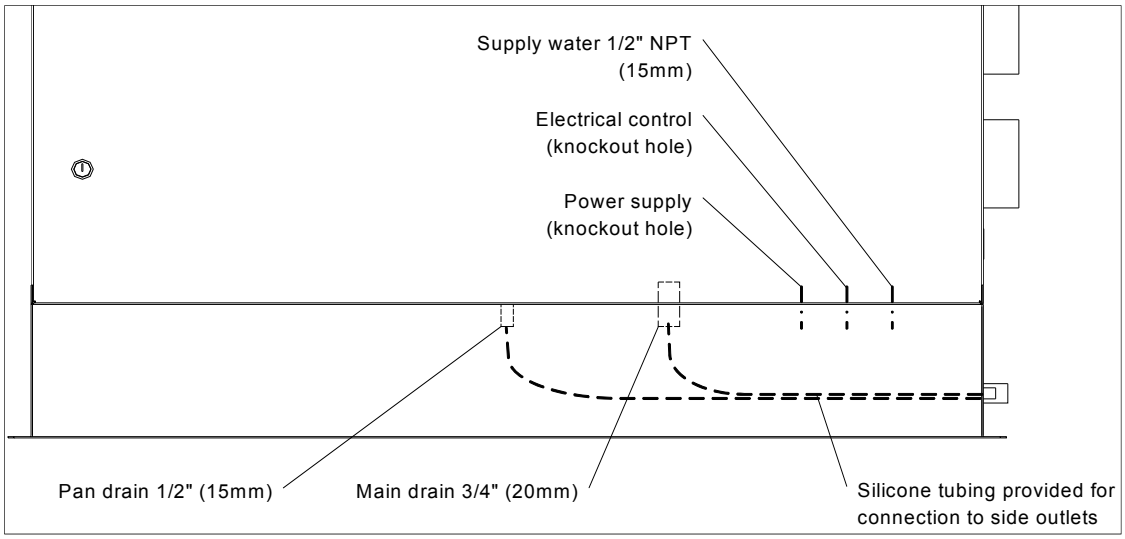


Illustration 23 - Weather Proof Enclosure Plumbing: Front View

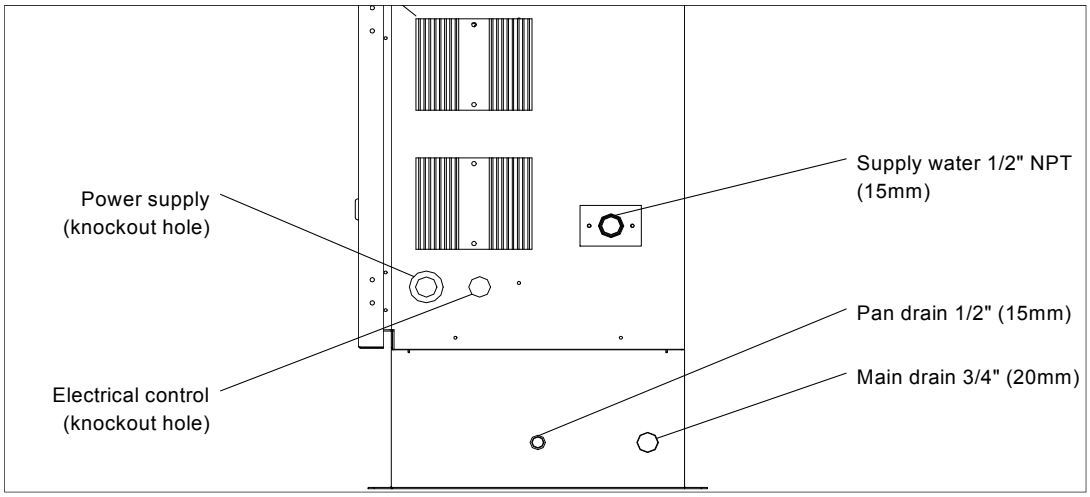


Illustration 24 - Weather Proof Enclosure Plumbing: Side View

Power Supply Connections

Caution: Risk of electric shock. Disconnect the Humidifier from the electric supply before proceeding with the connection.

WARNING: Risk of fire. Do not interchange the power terminal block designated L1, L2 and L3 with low voltage terminal block designated 1, 2 and 3.

- The wiring to the humidifier should be done by a qualified electrician, and should conform to the procedure, regulation and local codes.
- Use only copper conductors.
- An external over current protection and disconnect circuit breaker should be installed on the supply, adjacent to the humidifier.
- A knock-out (not supplied) should be installed at the bottom of the electrical compartment of the humidifier for strain relief of the supply cable.
- Ensure that the size of the wire conductors is appropriate for the current supplied.
- Ensure that each terminal connection is properly secured.
- The ground conductor should be equipped with a ring terminal and should be connected directly to the electrical panel on the indicated location.

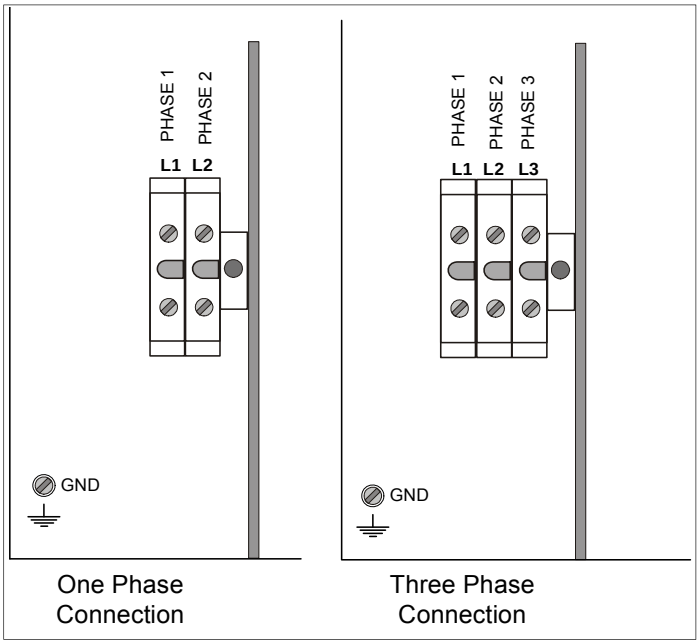


Illustration 25 - One and Three Phase Power Connections

Low Voltage Control Connections

Modulating Humidifier

Humidity Control by Humidistat (External Mode)

Note: If interlock is not used, jumper between terminal F and 5 must be installed.
If the humidifier is equipped with a Space Distribution Unit (SDU), the PD switch is already factory wired inside the SDU, do not wire the terminal #2.

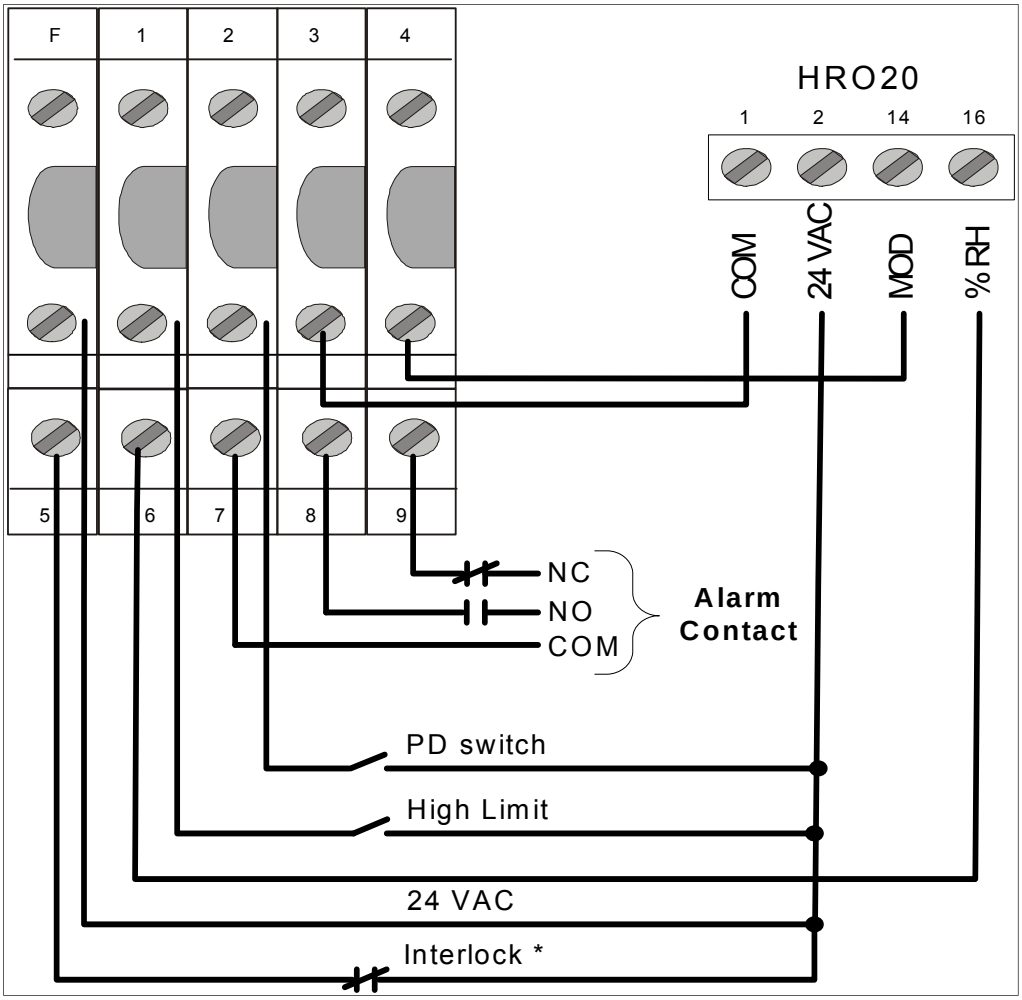


Illustration 26 - Connection to HRO20 humidistat or HRO20 with remote humidity sensor (SHR10 or SHC80)

Humidity Control by Humidifier (Internal Mode)

Humidity controlled by humidifier, using SHR10 or SHC80 as space sensor.

Note: If the humidifier is equipped with a Space Distribution Unit (SDU), the PD switch is already factory wired inside the SDU, do not wire the terminal #2.

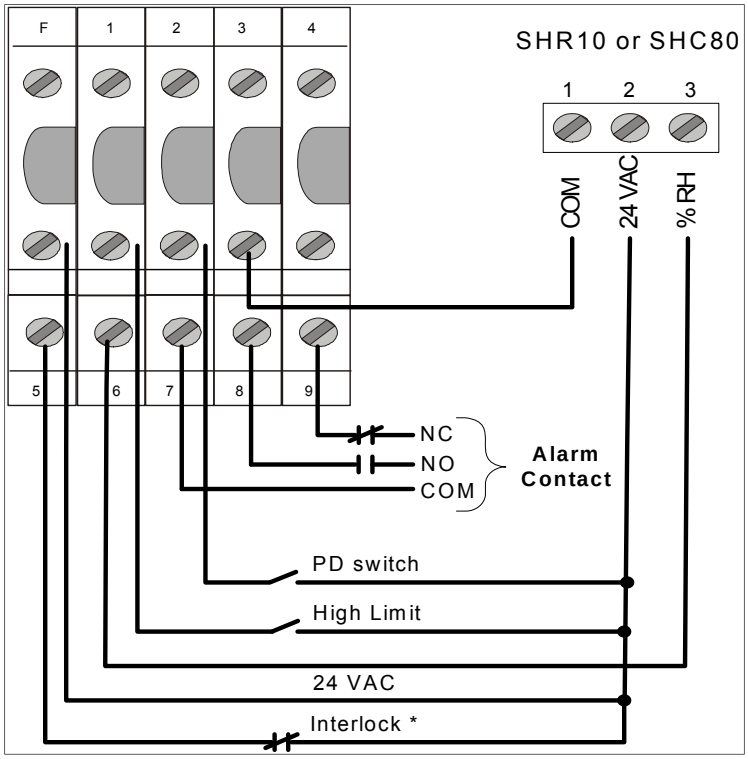


Illustration 27 - Humidity controlled by humidifier with SHR10 or SHC80 as space sensor

VAV system with humidity controlled by humidifier, using SHC80 as Hi-limit duct sensor and SHR10 or SHC80 as space sensor.

Note: If an interlock is not used, a jumper must be installed between terminal F and 5.

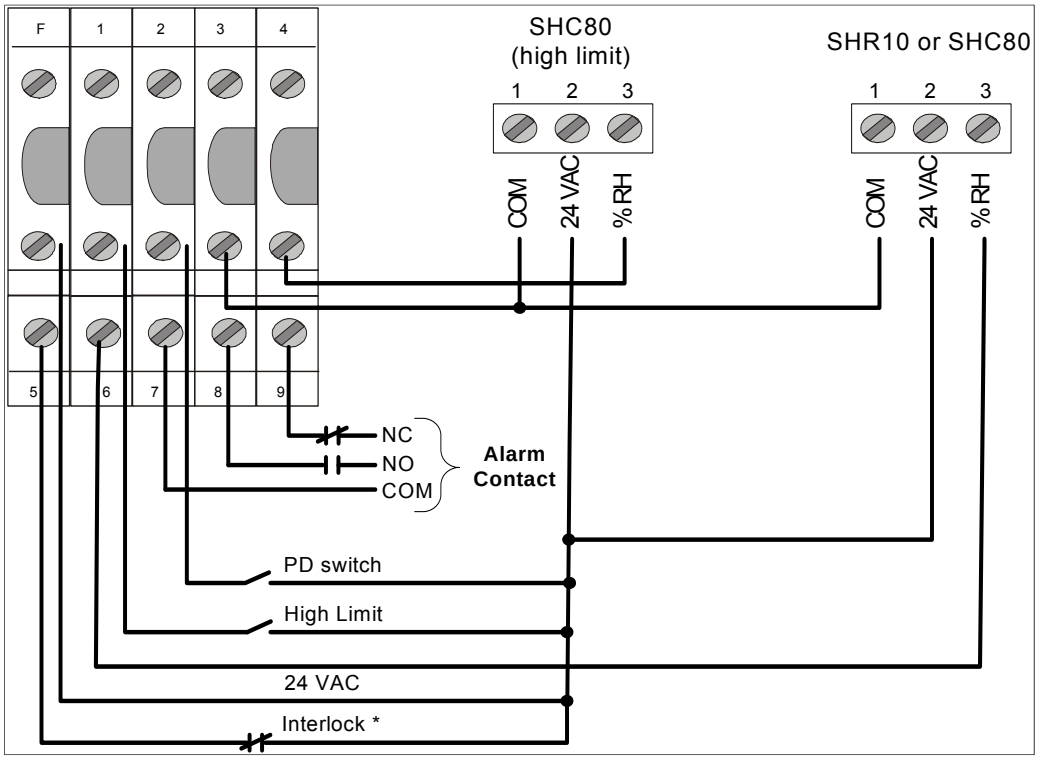


Illustration 28 - VAV system with humidity controlled by humidifier using Hi limit sensor and space sensor

Control Signals

Select the control signal through the menu. Wire the control input to terminal 3 and 4 as indicated in the illustration.

Control Signal 0-10 Vdc

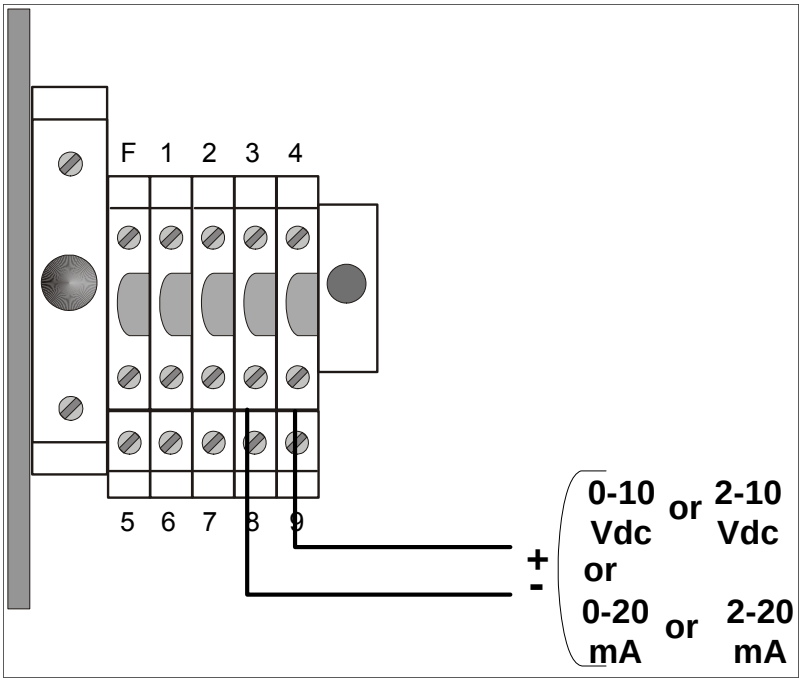


Illustration 29 - Control Signal 0 to 10 Vdc

Common Alarm Connections

- A volt free contact is provided in the form of both a Normally Open and Normally Closed contact that will switch on, in the event an alarm is activated on the SK300 humidifier.
- Wherever possible, it is recommended to use the Normally Closed contact. This contact will open in the event of a humidifier fault.
- These contacts should be used to switch a low voltage, ideally 24V, with a switching current of no more than 3 Amps.

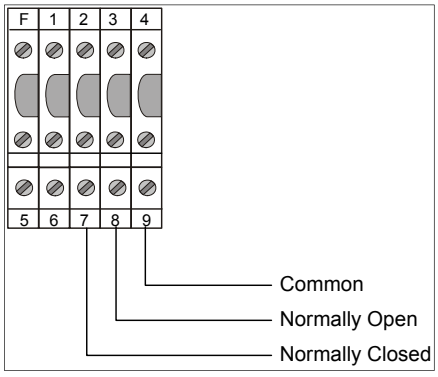


Illustration 30 - Common Alarm Connections

Controls Placement (Steam Dispersed into a Duct or AHU)

A typical humidifier control system should include the following along with the humidifier:

- A wall or return duct humidistat
- A high limit duct humidistat
- An air proving switch

Placement of these devices is critical to the proper operation of the overall system.

- The return duct humidistat must always be located before any outside air intake, in order to ensure accurate sensing of the air from the humidified space.
- Alternatively, a room humidistat can be used. The room humidistat should be located on an inside wall or column. It should not be near any discharge air from supply ducts or sources of heat or cold.
- The airflow switch must be positioned to accurately open on a loss of air flow, to prevent the humidifier from running when there is no air to absorb humidity.
- The high limit humidistat must be positioned far enough, 6’ minimum (1.8m), downstream of the steam dispersion manifold(s) to prevent it from getting wet, but still allows it to accurately prevent over humidification of the duct that could result in condensation.

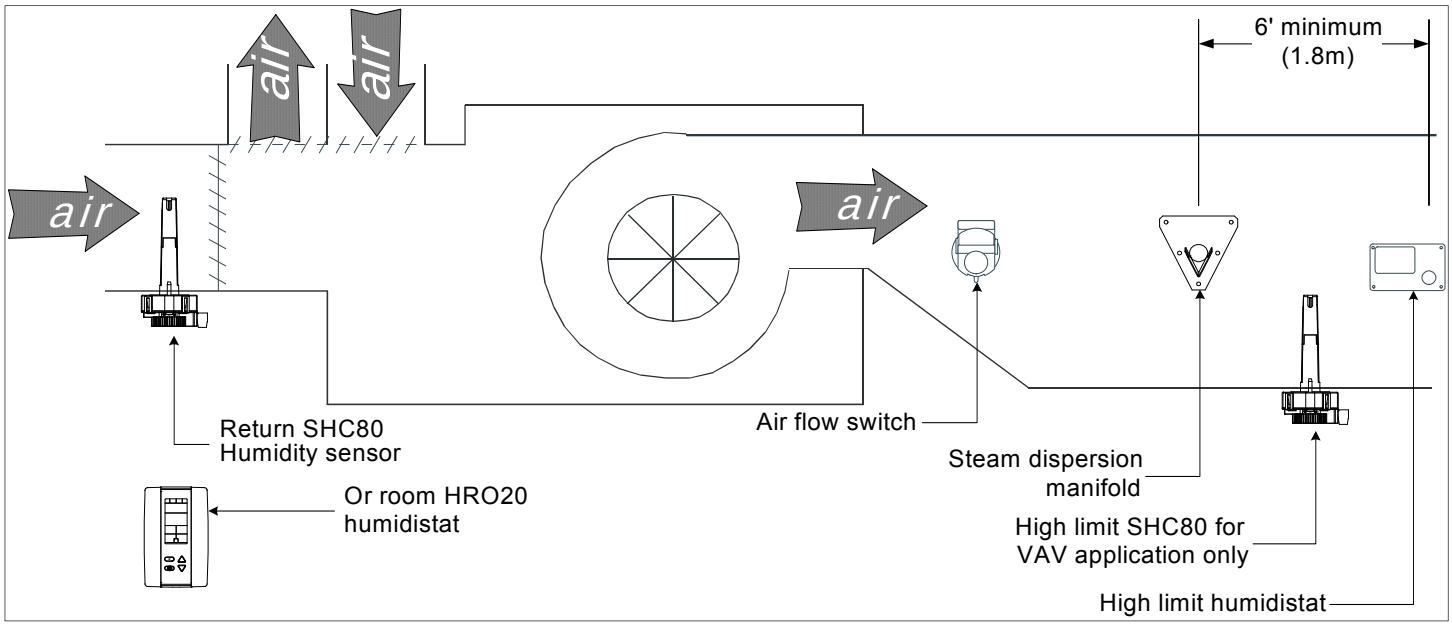


Illustration 31 - Controls Placement (Steam Dispersed into a Duct or AHU)

BACnet Interface Setup

The BACnet Interface PCB is located on the top right corner inside the electrical compartment. The DIP switches DS2 are set to OFF position (factory configuration).

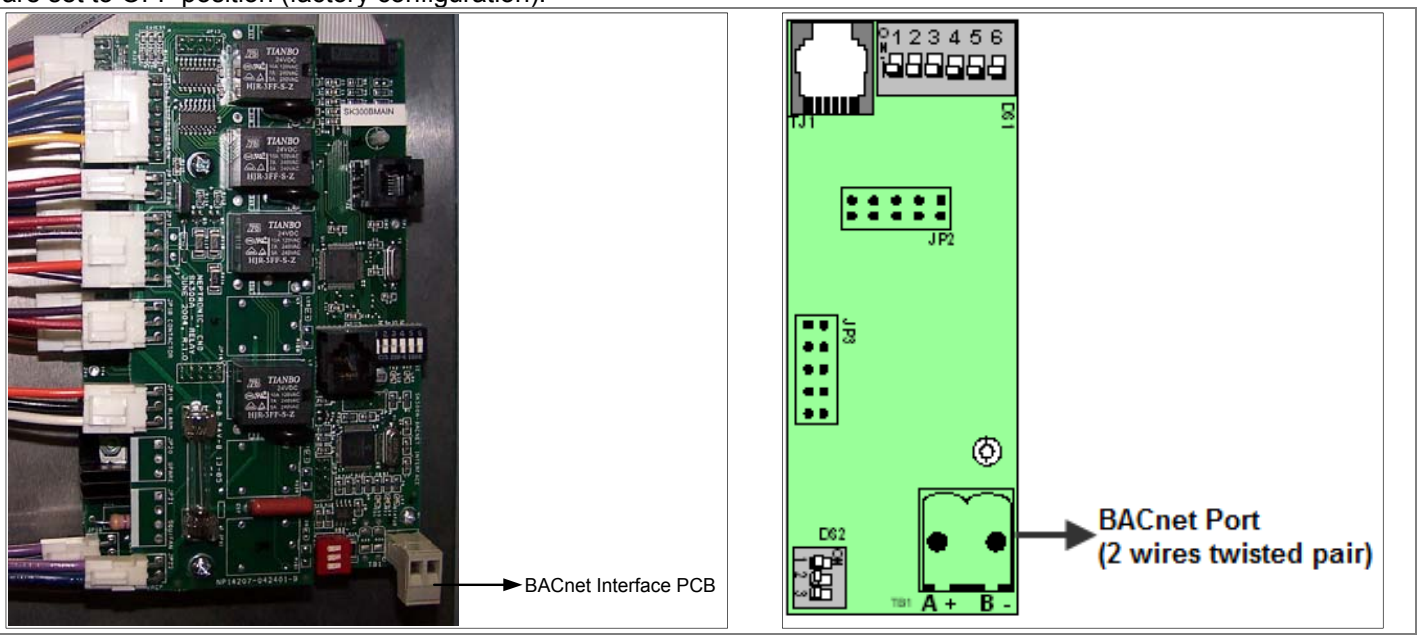
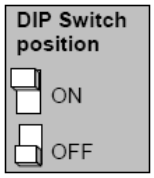


Illustration 32 - BACnet Interface PCB and Port



DIP Switch #	Status
DS2.1	OFF = Disable | ON = Enable
DS2.2 (End of Line)	OFF = Disable | ON = Enable
DS2.3	OFF = Disable | ON = Enable

DIP Switch Settings

DS1.1- Mode Selection

DIP Switch #	Mode
DS1.1	OFF = Operational Mode (factory configured) | ON = Configuration Mode
DS1.2 & 3	Baud Rate Selection
DS1.4, 5, &6	Not Used

DS1.2 and 3 - Baud Rate Selection

DIP Switch Position		Baud Rate
DS1.2	DS1.3	
OFF	OFF	9600
ON	OFF	19200
OFF	ON	38400
ON	ON	76800 *(factory configured)*

Display

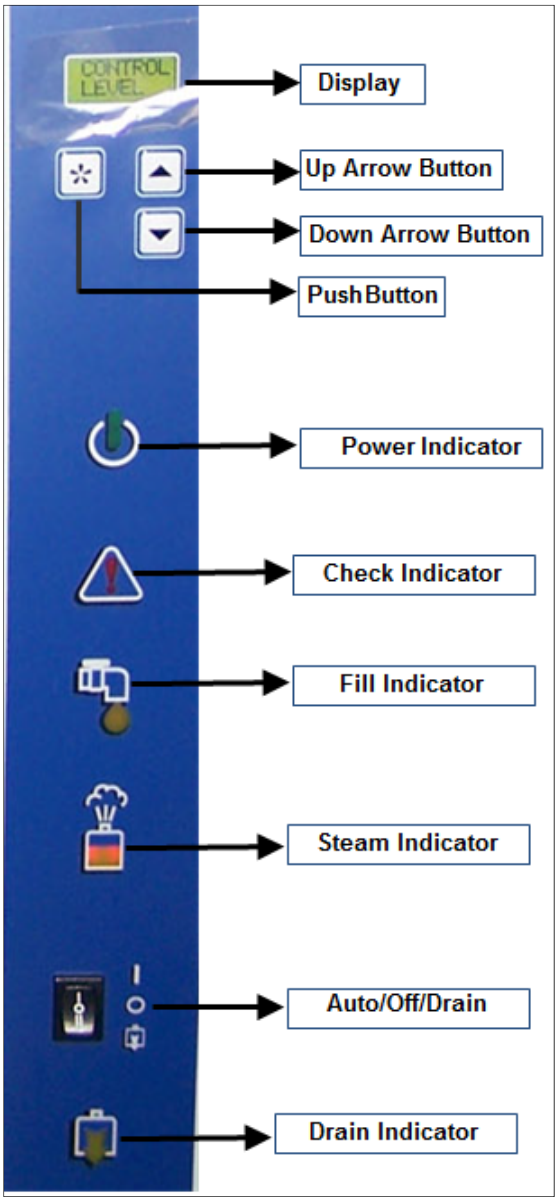


Illustration 33 - Display Features: Front Panel

Front Panel

The following are the display features of the Front Panel and their description:

Table 7 - Humidifier Front Panel Display Description

Options	Description
Alphanumeric Display	The Alphanumeric display indicates all the operation parameters and error messages.
Push/Power Button	The Push button is used to access program mode.
Up and Down Arrow Buttons	▲- Used to increase the control parameters of the humidifier. ▼ - Used to decrease the control parameters of the humidifier.
Power Indicator	☼ - The humidifier is powered by electricity and the switch is at the AUTO position. O - The humidifier is disconnected from the power supply.

Options	Description
Check Indicator	☼ - The CHECK indication is normally off. It will be activated as a warning during abnormal conditions of operation. ☼ (blinking) - If the CHECK indication is on, it means that maintenance is required. The running hours have exceeded the Service hours. See Service section on page 31. O - No abnormal conditions of operation.
Fill Indicator	☼ - Indicates that the water supply (fill) valve is open. O - Indicates that the water supply (fill) valve is closed.
Steam Indicator	☼ (blinking) - On Modulating model, the STEAM indicator blinks ON and OFF in proportion to the percentage of steam output percentage the humidifier is generating. This proportion is displayed on the display. When the output reaches 100%, the indicator will stop blinking. O - Indicates that steam is not being produced.
Switch Auto/Off/Drain	Auto - Position AUTO (I) Humidifier will generate steam based on demand from the humidistat. OFF - Position OFF (O) - Humidifier will shut off. DRAIN - Position DRAIN Humidifier will stop operating and the evaporation chamber will drain the water out. This will be done typically at regular service.
Drain Indicator	☼ - Indicates that the drain pump is on, either as a result of an automatic drain cycle or because the front panel switch is manually set to DRAIN. O - Indicates that the drain pump is off.

Modes – Description

OFF Mode

When the rocker switch is in the OFF position, the display shows the model of the humidifier and the program version number as follows:

SKB 3XX
NEP R1.5

Scroll Mode

When the rocker switch is in the AUTO position, the display scrolls the following information every 6 seconds:

Table 8 - Scroll Mode Display Description

Display and Description	Notes
HUMIDITY 45.2% Percentage of relative humidity	Only on modulating humidifiers (suffix M). Percentage of relative humidity.
DEMAND 92% Percentage of demand	Control signal input response from 0 to 100%.
OUTPUT 100% Percentage of output	Output capacity of the humidifier.
WATR LVL 92% Percentage of water level	Corresponds 100% to optimum water level in the evaporation chamber.
WATR TMP 65 C Temperature of water in Celsius scale	Temperature of water inside the evaporation chamber.

Diagnostic Mode

When the following conditions occur, the diagnostic messages override the scrolling information:

Table 9 - Diagnostic Mode Display Descriptions

Display	Description	Values
SSR TMP 40 C	Displays the SSR temperature.	-
WTR TOFF 100 C	Adjust the water temperature offset.	Default: 0, Range: -10°C to +10°C
WTR FREQ 8000 HZ	Displays the water level frequency.	-
WTR LOFF 100%	Adjust the water level offset.	Default: 0%, Range: -10% to +10%
FOAM PRB 207	Displays the foaming probe value.	-
DRN TM OUT 5 MIN	Adjust the drain time.	Default: 5 mins SK302/304/306 7 mins SK310/314/320/330 8 mins SK340/360 Range: 4 to 16 mins
NO DEMND 72 HRS	Adjust the delay to drain out the humidifier from its remaining water when there is no demand. Drain remaining water to prevent the growth of bacteria.	Default: 72Hrs, Range: 1 to 250 Hrs
HOLD TMP OFF	Adjust the holding temperature of the evaporation chamber for a faster response to demand.	Default: OFF Range: 15°C to 90°C or OFF
ANTI-FRZ OFF	Adjust the anti freezing temperature of the evaporation chamber of humidifier that has to be installed in the weather proof enclosure.	Default: OFF Range: from 4°C to 10°C or OFF
ALARM BEEP ON	Adjust the alarm beep.	Default: OFF Range: ON or OFF
T UNIT CELSIUS	Adjust the temperature unit scale between Celsius and Fahrenheit.	Default: Celsius Range: Celsius/Fahrenheit -
CONTRAST 25	Adjust the contrast level of LCD display.	Default: 25 (legible LCD) Range: 0 to 40
SKB 3XX NEP R1.5	Displays the humidifier model and revision number of the installed program.	-

Alarms

Display	Description
AIR FLOW OPEN	Indicates that the airflow is not detected by the air pressure switch (Modulating unit only).
HI LIMIT CUT-OUT	Indicates that the humidity level has exceeded the setpoint on the high limit humidistat.
DRAIN CYCLE	Indicates that the unit is in the automatic drain mode.
OVER HEATED	Indicates that the temperature inside the container has exceeded the boiling temperature. The humidifier has shut off automatically.
PROBE DEFECTED	Indicates that the water level sensor is not operational. The humidifier has shut off automatically.
NO LEVEL	Indicates that the water has not reached the level probe.
CLEANING REQUIRED	Indicates that the humidifier has reached the number of hours of operation and requires cleaning of the evaporation chamber. No interruption to the operation of the humidifier.
SERVICE UNIT NOW	Indicates that the humidifier has reached the number of hours of operation and requires service. The operation of the humidifier has been interrupted.
FOAMING CYCLE	Indicates that the Anti Foam Energy Conservation (AFEC) has detected foam. The unit drains for a few minutes and returns to normal operation.
DRN/PROBE BLOCK	Indicates that the unit has been drained but the water level does not decrease. The humidifier has shut off automatically.
KLIXON OPEN	Indicates that the temperature in the evaporation chamber exceeded the preset temperature set by the high temperature switch.
PCB FUSE OPEN	Indicates that the internal 24Vac is shorted.
24 VAC SHORTED	Indicates that the external 24Vac (for humidity) controller is shorted or over loaded.
24 VDC SHORTED	Indicates that the internal 24Vdc (probe or fan) is shorted.
REFILL TIME OUT	Indicates that the time to fill the evaporation chamber has exceeded the preset time in the microprocessor.
WATR TMP DEFECTED	Indicates that the water temperature sensor is not present or is defective.
SSR OVER HEATED	Indicates that the temperature of the SSR is too high. Verify the operation of the cooling fan.

Display	Description
INTERLCK OPEN	Indicates that the interlock safety is open. The humidifier has stopped functioning.
END OF SEASON	Indicates that the humidifier will be in stand-by mode. When there is no humidity demand for a period of more than 72 hours, the humidifier will drain the water from the evaporation chambers automatically and will be in stand-by mode.

Programming Mode

To access the Programming Mode, push the * button. To move to the next program function, push the button twice. Use the ▲ and ▼ buttons to make any selection.
The changes made in the Program Mode are saved into a non-volatile memory. When the humidifier is in the menu driven Program Mode, the normal operation of the humidifier is halted. To resume normal operation, exit the menu program mode by pressing the * button until the alphanumeric display is clear.

1. "CONTROL EXTERNAL"

Default: External
Range: Internal, External, Com Port

Select the control mode.

- If you select External, the humidifier receives control demand from the control input.
- If you select Com Port, the humidifier receives control demand from the BACnet communication port.

2. "SP SOURC INTERNAL"

Default: Internal
Range: Internal, External, Com Port

Select the source for room humidity setpoint.

3. "SETPOINT 40% RH"

Range: 10% to 90%

Select the relative humidity setpoint.

4. "DUCT SRC DISABLE"

Default: Disable
Range: Disable, External, Com Port

Select the source for duct's high limit relative humidity (control Internal only).

5. "DUCT SP 80% RH"

Range: 10% to 90%

Select the high limit relative humidity setpoint (duct source External only).

6. "DRAIN 8 HRS"

Default: 4 hours
Range: 1 to 24 hours
Increment: 1 hour

Select the frequency for drain cycle. Generally, the harder the water is, higher the drain cycle frequency should be. Drain cycle setting does not affect the AFEC system.

7. "RUNNING 0645 HRS"

Number of running hours (information display only)

Indicates the number of hours the humidifier has been running since the last servicing.

After every service, reset the number of hours of operation to zero by pressing the ▲, ▼ buttons simultaneously for 30 seconds. This will reset the number of hours of operation to zero.

8. "SERVICE 1000 HRS"

Default: 1000 hours
Range: 400 to 1500 hours
Increment: 100 hours

Set the number of hours of operation before the humidifier calls for servicing. Generally, the harder the water is, the lesser the number of hours of operation before servicing can be initiated.

9. "LOCK ON 80% PWR"

Default: 100%
Range: 0 to 100%
Increment: 1%

Select the output span, the rate at which the humidifier delivers 80% of the maximum rated output at full demand.

10. "RESET ALRM NO"

Default: No
Range: Yes/No

Select Yes or No to enable or disable the reset alarm option by pressing the ▲ and ▼ buttons simultaneously.

11. "CTRL INP 2-10 VDC"

Default: 2 to 10 Vdc
Range: 0 to 10 Vdc, 2 to 10 Vdc, 0 to 20mA, 4 to 20 mA

Select control input signal.

12. "HUM. INP"

Default: 2 to 10 Vdc
Range: 0 to 10 Vdc, 2 to 10 Vdc, 0 to 20mA, 4 to 20 mA

Select humidity input signal.

13. "DUCT INP 2-10 VDC"

Default: 2 to 10 Vdc
Range: 0 to 10 Vdc, 2 to 10 Vdc, 0 to 20mA, 4 to 20 mA

Select duct humidity input signal.

14. "SKB 3XX NEP R1.5"

Revision level of the installed program (information display only)

Start-up Procedure

We recommend to strictly following this Start-up procedure in order to avoid any anomaly resulting from wrong cleaning of the components. In case of problem or discrepancy, see the Troubleshooting section.

1. Ensure that the mechanical, electric and plumbing connection are done and secured.
2. Ensure that the low voltage control circuit is done and correct.
3. Turn the water shutoff valve on (outside the humidifier) and check that the drain connections are connected to the main drain line with sufficient diameter.
4. Turn the power on to the humidifier from the circuit breaker disconnect switch. The POWER indicator should be on.
5. Press the front switch to the AUTO (I) position.

   Perform a manual cleaning cycle.

   a. Press the rocker switch to the drain down position . The humidifier initiates a drain cycle and empties the evaporation chamber.

   b. Press the rocker switch upward to the Auto (I) position . The humidifier fills the evaporation chamber with water. The Fill light is illuminated.

   c. Press the rocker switch to drain down position again to empty the chamber.
6. Your humidifier is now fully operational.

Service

The humidifier requires a regular maintenance service to ensure efficient and trouble-free running. Regular service involves cleaning the evaporation chamber and its components manually. Generally, frequency of cleaning can range from 2 months to once in a year. However, the cleaning frequency depends on the following specific factors:

- Quality of water
- Frequency of automatic drain cycles
- Demand placed on the humidifier

All SK300 humidifiers are programmed for a 1000 hours of operation. This is a default factory setting.

To view the number of hours the humidifier has run and the number of service hours, press the menu button on the front panel several times till you view the information on the digital display.

At the end of 1000 hours of operation, the red LED on the front panel starts blinking on off continuously. This indicates that the humidifier is due for service. The humidifier operates for an additional 50 hours and the LED continues to blink on and off. At the end of the 50 additional hours, the red LED stays on continuously. Though the humidifier continues to run, it is important to service the humidifier at the earliest.

Clean the Evaporation Chamber

Cleaning the Evaporation Chamber involves the following steps:

Stage 1 - Shut down electrical supply and disassemble the humidifier

Stage 2 - Remove and clean the evaporation chamber

Stage 3 - Reassemble the evaporation chamber

Stage 4 - Restart the humidifier

Pre-requisite for cleaning the Evaporation Chamber

Before you commence the cleaning procedure, ensure that the evaporation chamber is cool and comfortable to handle as the evaporation chamber and its contents can be extremely hot and can cause burning. If it is hot, allow the evaporation chamber to cool by initiating a drain cycle.

1. Press the rocker switch to the drain down position . The humidifier initiates a drain cycle and empties the evaporation chamber.
2. Press the rocker switch upward to the Auto (I) position . The humidifier fills the evaporation chamber with water. The Fill light is illuminated.
3. Press the rocker switch to drain down position again to empty the chamber.

At the end of the drain cycle, check the temperature of the evaporation chamber. To check the temperature, open the front door of the humidifier and touch the chamber with the back of your hand. If it is cool enough to handle, shut down the electrical supply. If not, repeat the drain cycle till it is cool enough. If further drain cycle is not required, press the rocker switch to OFF (O) position .

Stage 1 - Shut down electrical supply and disassemble the humidifier

Caution: Risk of electric shock. Shut down the electric supply of the humidifier.
Disconnect the power at the External Breaker/Fused Disconnect before commencing servicing

1. Press the Power button on the control panel to switch off the humidifier.
2. Remove the power supply to the humidifier at the disconnect switch or the breaker.
3. Disconnect the power connector to the heating elements.

Model	Method
SK302 to 306	Unscrew the connector
SK310 to SK36	Squeeze the locking ears of the high voltage connector and pull it apart

4. Remove the clip-on level sensor board located on the chamber cover.
5. Disconnect the wire connector to the high temperature safety cut-out .
6. Loosen the steel clamps that hold the steam hose in place with a 5/16" (8mm) nut driver or a standard screw driver.
7. Loosen the compression brass connectors using an adjustable wrench and a 11/16" (17mm) key. Unscrew the brass nut and slide it back.

Disconnect power

Disconnect heating elements

small units

big units

Remove clip-on level sensor

small units

big units

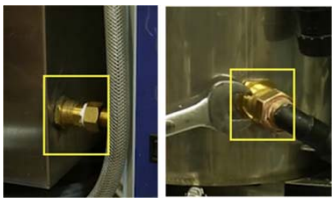
Disconnect high temperature safety cut-out

small units

big units

Loosen steel clamps

Loosen brass connectors



Stage 2 - Remove and clean the evaporation chamber

1. Slide out the boiling chamber.

The evaporation chamber still contains few inches of water, tilt it slightly to ensure that you do not spill this water on yourself.

Ensure that your footing is secure when lifting the evaporation chamber. Evaporation chambers in large humidifiers such as SK340 and SK360 may weigh more than 35 lbs (15 kgs). Seek assistance from another person while removing the chamber.

2. Uncouple the clamp connectors.

Model	Method
SK302 to 306	Unlatch the three latches located around the evaporation chamber.
SK310 to SK36	Turn the four or eight latches located around the evaporation chamber.

3. Open the lid along with the elements inside.

Do not clean the heating element. They are self-cleaning. Any mineral accumulation breaks off and falls to the bottom during the course of operation.

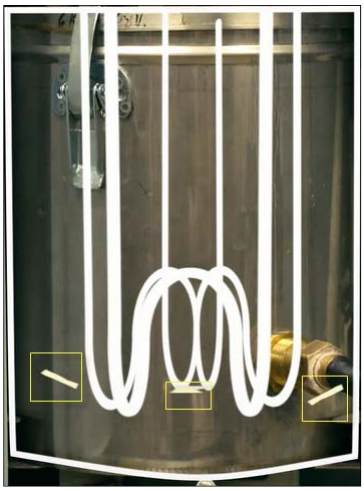
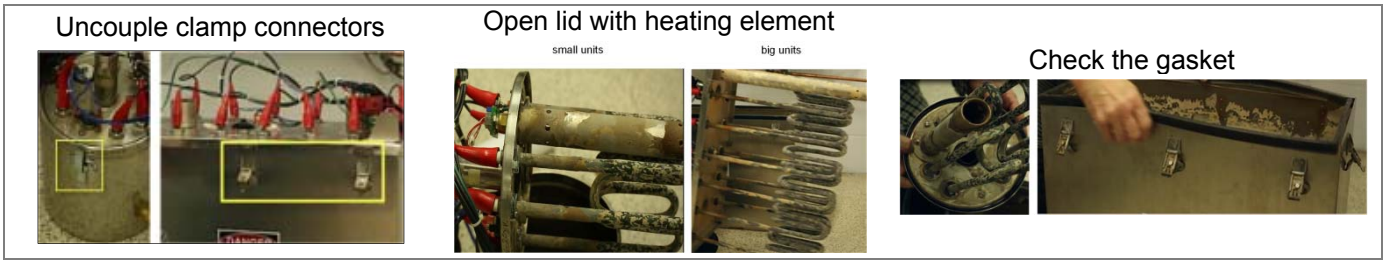


Illustration 34 - Metal deposit dislodge during operation

- Remove the residue that has accumulated inside the chamber.
- Rinse the chamber with water only. Do not use any acid or vinegar.
- Do not scrape off the walls of the chamber.
- Ensure that the fill drain aperture is not blocked.

4. Check the gasket and ensure that it is in good shape. Replace the gasket if it is dry, torn or hardened.
5. Replace the lid back on the chamber.



Water Level Sensor

The water level sensor is encased in a chamber that protects the sensor. If the sensor has been operating correctly prior to the service shut down and has not displayed the *PROBE DEFECTED* and *OVER HEATED* errors, do not clean the sensor.

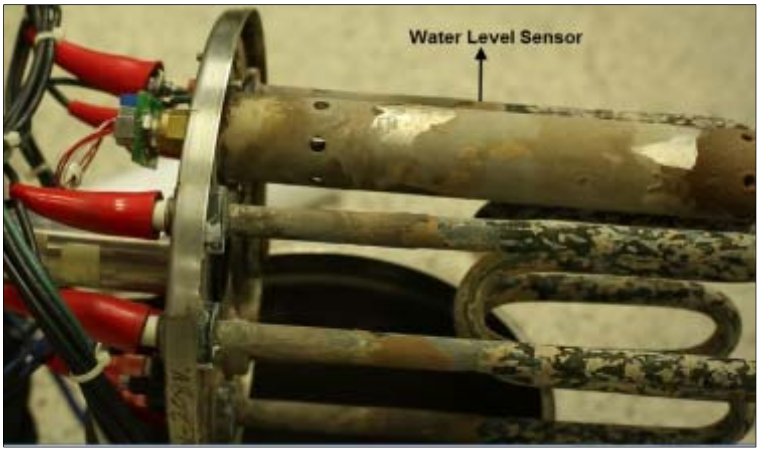


Illustration 35 - Water Level Sensor

If the sensor has displayed the *PROBE DEFECTED* and *OVER HEATED* errors, then clean the sensor.
To clean the sensor, perform the following steps:

1. Remove the chamber from the unit by unscrewing the two screws that hold the chamber. These screws are located on the chamber itself.
2. Remove the chamber carefully without touching or damaging the water level sensor.
3. Clean the sensor using a soft cloth.

The water level sensor is covered by a thin layer of Teflon. Any scratch or damage to this layer results in non functioning of the humidifier.

4. Clean the protection chamber in the same way as the evaporation chamber.
5. Reattach the chamber to the cover by tightening the screws on top of the cover.

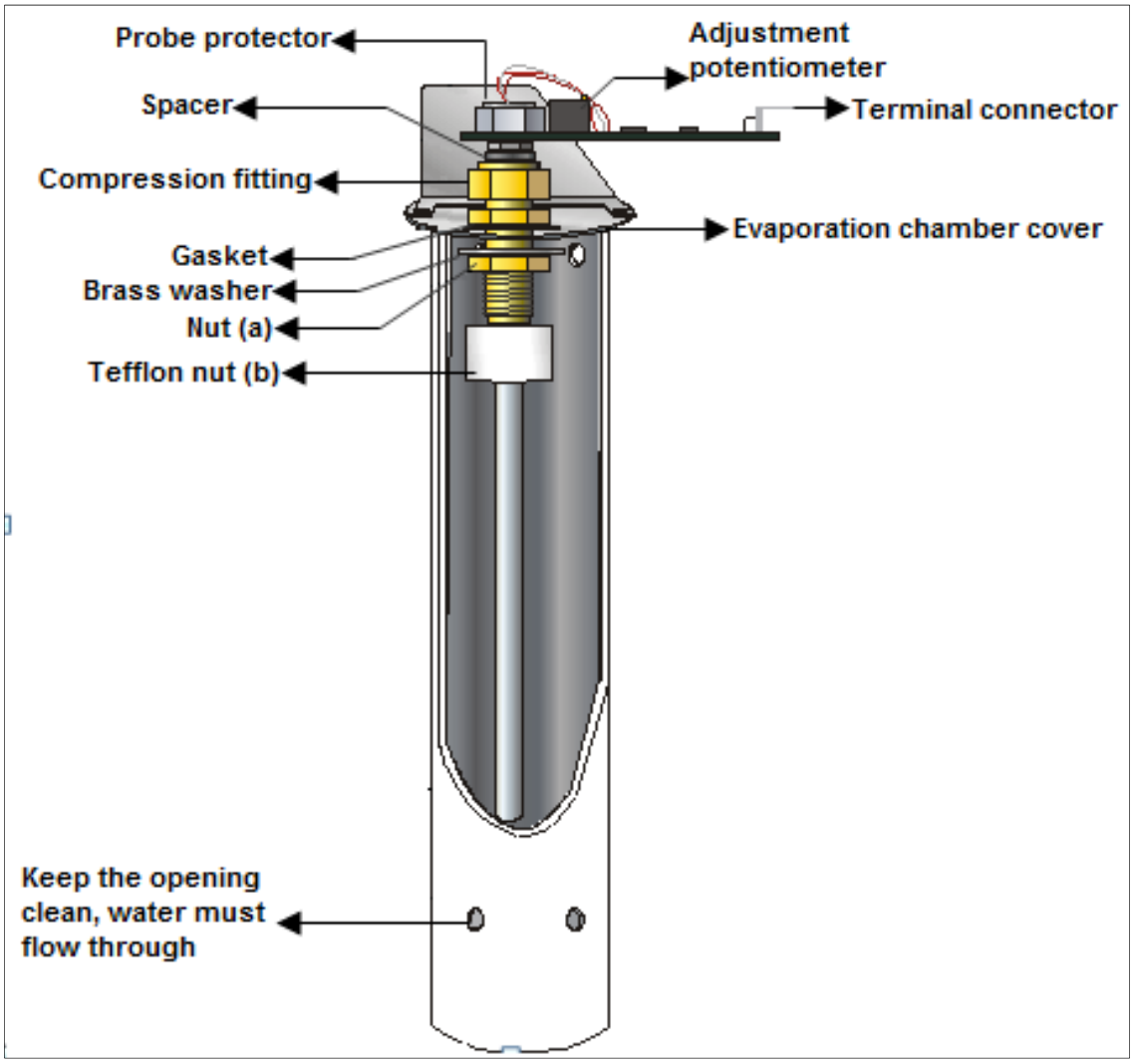


Illustration 36 - Water Level Sensor and Protection Chamber

Stage 3 - Reassemble the humidifier

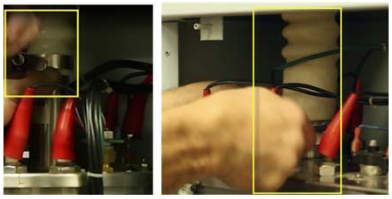
1. Mount the boiling chamber back into the unit.
2. Tighten the compression brass connectors.
3. Reconnect the steam hose.
4. Reconnect the clip-on level sensor.

   Reconnect the clip-on level sensor only when the power is disconnected. If, for any reason, you did not connect the level sensor during the reassembling, ensure to disconnect the power first, and then reconnect.

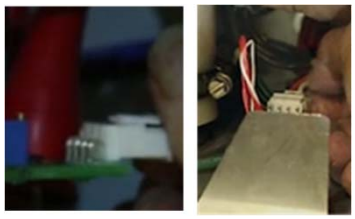
5. Reconnect the high temperature safety cut-out wire.
6. Reconnect the heating elements.
7. Turn the power back on at the disconnect switch or the breaker

Tighten brass connectors

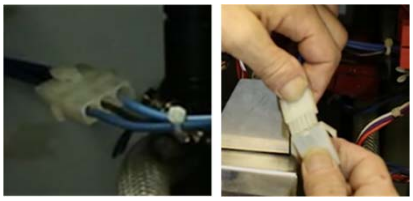
Reconnect steam hose



Reconnect clip-on level sensor



Reconnect high temperature safety cut-out



Reconnect heating elements

Turn the power on

Stage 4 - Restart and reset the humidifier

1. Power up the humidifier. The light is illuminated.
2. Press the button to enter the Programming mode and reset the Running hours.
3. Set the front panel switch to AUTO. The humidifier initiates a fill cycle, the indicator is illuminated. The humidifier starts producing steam as soon as there is a demand.

Exploded View and Bill of Material

Exploded View

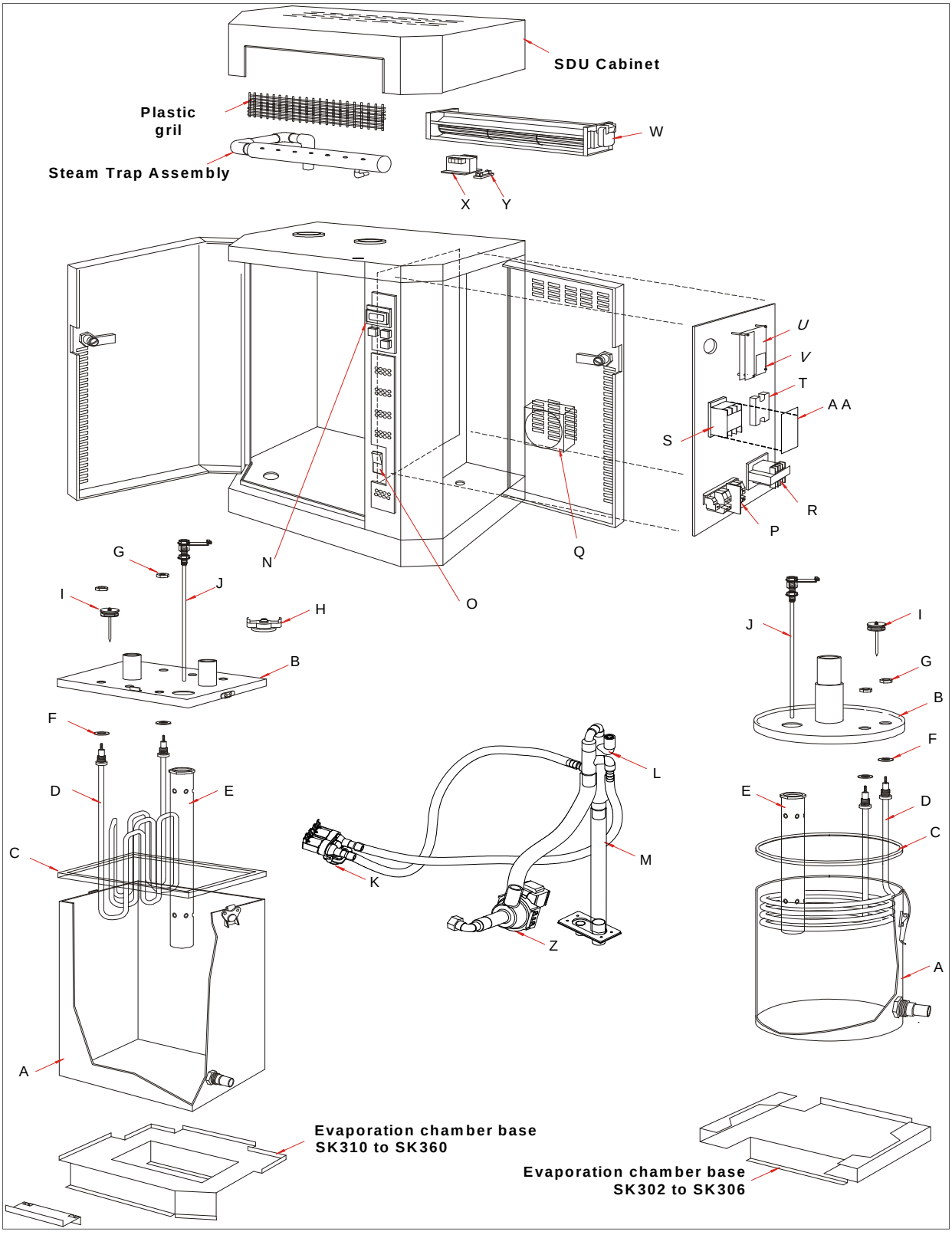


Illustration 37 - Exploded View of Humidifier

Bill of Material

Table 10 - Model Description and Part Numbers

Item	Description	Model	Part number
A	Container of evaporation chamber	SK302 to 306	SW CONTSMA-ASSY
		SK310 to SK330	SW CONTMED-ASSY
		SK340 & SK360	SW CONTLAR-ASSY
B	Cover of evaporation chamber	SK302 to 306 (1 phase)	SP 4018-M
		SK304 to 306 (3 phases)	SP 4019-M
		SK310 & SK314	SP 4183A
		SK320 & SK330	SP 4183B
		SK340	SP 4186
		SK360	SP 4185A
C	Evaporation chamber gasket	SK302 to 306	SP 1008
		SK310 to SK330	SP 1021
		SK340 & SK360	SP 1022
D	Heater element	See Table 11 - Model, Heater Element, Transformer, and Voltage Description	
E	Level sensor chamber	SK302 to 306	SP 4196-M
		SK310/314/320/340	SP 4197-M
		SK330 & SK360	SP 4198-M
F	Washer (elements)	SK302 to SK360	SP 1005
G	S/S hex. Jam nut (elements)	SK302 to SK360	SP 2330
H	High temperature switch (klixon)	SK302 to SK360	SP 3035
I	Foam sensor	SK302 to 306	SW FOAMSM-ASSY
		SK310/314/320/340	SW FOAMMED-ASSY
		SK330 to SK360	SW FOAMLG-ASSY
J	Water level sensor	SK302 to 306	SW SK300BPROBSMA
		SK310/314/320/340	SW SK300BPROBMED
		SK330 & SK360	SW SK300BPROBMED
K	Water supply valve	SK302 to SK360	SP 6007
L	Fill and drain trap assembly	SK302 to 306	SW TRAPSMA-P
		SK310 to SK330	SW TRAPMED-P
		SK340 & SK360	SW TRAPLAR-P
M	Silicone tubing ½”	SK302 to SK360	SP 1023A
	Silicone tubing ¾”		SP 1023B
	PCV tubing ½”		SP 1027
N	Alphanumeric display	SK302 to SK360	NW SK300BDISPSS
O	"AUTO/OFF/DRAIN" rocker switch	SK302 to SK360	SW SKSWITCH-ASSY
P	Terminal block and high voltage connectors	SK302 to SK360	-
Q	Cooling fan	SK302 to SK360	SP 3007
R	Transformer	Refer to Table 11 - Model, Heater Element, Transformer, and Voltage Description	
S	Contactor	Refer to Table 11 - Model, Heater Element, Transformer, and Voltage Description	
T	Solid State Relay	50 A	SP 3102
		90 A	SP 3103
		125 A	SP 3105
U	Main Printed Circuit Board	SK302 to SK360	NW SK300BMAIN-TES
V	BACnet Interface Printed Circuit Board	SK302 to SK360	NW SK300BBACNETSS
W	SDU fan	SDU I	SW FANSDU1-RET
		SDU II	SW FANSDU2-RET
		SDU III	SP 3010
X	Transformer	Refer to Table 11 - Model, Heater Element, Transformer, and Voltage Description	

Item	Description	Model	Part number
Y	Fuse inside SDU	SDU I and SDU 2	SP 5105
		SDU 3	SP 5106
Z	Drain pump	SK302 to SK360	SP G4101

Table 11 - Model, Heater Element, Transformer, and Voltage Description

Model	Voltage	D Heater element	R Transformer	S Contactor	X SDU Transformer
SK302	240V/1~	SW 5932	SP 3310	SP 3029	SP 3312
	208V/1~	SW 5933	SP 3308	SP 3029	SP 3305
	480V/1~	SW 5934	SP 3321	SP 3029	SP 3329
	600V/1~	SW 5935	SP 3341	SP 3029	SP 3349
SK304	240V/1~	SW 5937	SP 3310	SP 3029	SP 3312
	208V/1~	SW 5940	SP3308	SP 3029	SP 3305
	208V/3~	SW 5924	SP3308	SP 3080	SP 3305
	480V/1~	SW 5941	SP 3321	SP 3029	SP 3329
	480V/3~	SW 5923	SP 3321	SP 3080	SP 3329
	600V/1~	SW 5942	SP 3341	SP 3029	SP 3349
	600V/3~	SW 5925	SP 3341	SP 3080	SP 3349
SK306	240V/1~	SW 5938	SP 3310	SP 3100	SP 3312
	208V/1~	SW 5943	SP3308	SP 3220	SP 3305
	208V/3~	SW 5933	SP3308	SP 3080	SP 3305
	480V/1~	SW 5944	SP 3321	SP 3029	SP 3329
	480V/3~	SW 5934	SP 3321	SP 3080	SP 3329
	600V/1~	SW 5945	SP 3341	SP 3029	SP 3349
	600V/3~	SW 5935	SP 3341	SP 3080	SP 3349
SK310	208V/3~	SW 5959	SP 3308	SP 3220	SP 3305
	480V/3~	SW 5958	SP 3321	SP 3080	SP 3329
	600V/3~	SW 5957	SP 3341	SP 3080	SP 3349
SK314	208V/3~	SW 5946	SP 3308	SP 3027	SP 3305
	480V/3~	SW 5947	SP 3321	SP 3080	SP 3329
	600V/3~	SW 5948	SP 3341	SP 3080	SP 3349
SK320	208V/3~	*	*	*	-
	480V/3~	SW 5950	SP 3321	SP 3100	SP 3352
	600V/3~	SW 5951	SP 3341	SP 3080	SP 3353
SK330	480V/3~	SW 5952	SP 3321	SP 3027	SP 3352
	600V/3~	SW 5939	SP 3341	SP 3220	SP 3353
SK340	208V/3~	*	*	*	-
	480V/3~	SW 5950	SP 3321	SP 3220 (2x)	-
	600V/3~	SW 5951	SP 3341	SP 3027	-
SK360	480V/3~	SW 5952	SP 3321	SP 3027 (2x)	-
	600V/3~	SW 5939	SP 3341	SP 3220 (2x)	-

* Available, please consult factory.

Troubleshooting

Humidifier does not operate (Power Off)

Indicator	Status	Display (blank)
Power	OFF	
Check	OFF	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- The humidifier is not powered.
- Wires harnesses inside the humidifier are not secured properly.

Corrective Action

- Check for the main power supply and fuses.
- Check the transformer and the low voltage fuse.
- Check the high temperature switch, the wires harnesses and the main PC board.

Humidifier does not operate (Power On)

Indicator	Status	Display
Power	BLINK	
Check	OFF	
Fill	OFF	
Steam	OFF	
Drain	OFF	

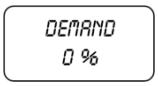
Cause

- The rocker switch is at the OFF position.
- Wire harness from the LED display panel to the main PC board is not secured properly.

Corrective Action

- Press the rocker switch to the AUTO position.
- Check the white color wire harness.
- Press the RESET button on the main PC board.

Humidifier does not produce steam (No Demand)

Indicator	Status	Display
Power	ON	
Check	OFF	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- Modulating humidifier: no analog signal.
- On/Off humidifier: no demand from humidistat .
- Control wires are not properly secured to the terminal blocks.

Corrective Action

- Verify the setting of the humidistat.
- Verify the connections of the wires to the control terminal blocks.

Humidifier does not produce steam

Indicator	Status	Display
Power	ON	
Check	OFF	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- Air flow is not detected by air pressure switch .
- Control wires are not properly secured to the terminal blocks.

Corrective Action

- Check the fan operation.
- Verify the wires to the control terminal blocks #1 & 2.

Humidifier does not produce steam

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- High limit humidistat is open.
- Control wires are not properly secured to the terminal blocks.

Corrective Action

- Check the operation of the high limit humidistat.
- Verify the wires to the control terminal blocks #1 & 2.

No water inside the evaporation chamber or Humidifier does not stop draining

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	ON	
Steam	OFF	
Drain	OFF	

Cause

- Humidifier is filling water but has not reached yet or does not reach the high limit of the water level sensor.
- Humidifier is not filling water.

Corrective Action

- Verify if the drain valve is open.
- Check if the shutoff valve on the water supply line is open.
- Verify the operation of the fill valve.
- Check that the fill valve strainer and the external strainer are not blocked.

Humidifier is always on Foam cycle

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	ON	
Steam	OFF	
Drain	ON	

Cause

- Excessive foaming condition inside the evaporation chamber.
- Foaming sensor is grounded.

Corrective Action

- Verify the quality of the supply water.
- Verify if chemical products were used to clean the evaporation chamber during maintenance. Rinse the chamber properly with water.
- Check the setting of the Drain cycle. Reduce the time between Drain cycles.

Humidifier is operating and the CHECK light is blinking

Indicator	Status	Display
Power	ON	
Check	BLINK	
Fill	OFF	
Steam	ON	
Drain	OFF	

Cause

- The running hours have exceeded the Service hours.

Corrective Action

- Service the evaporation chamber, see Service section.
- Reset the Running hours to cancel the blinking of the CHECK light.

Humidifier is not operating and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

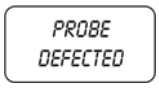
Cause

- The electronic temperature sensor inside the water level sensor had sensed abnormal temperature.

Corrective Action

- Verify if the humidifier was operating below the standard water level and then replace the water level sensor, item J.

Humidifier is not operating and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- The water level sensor is damaged.

Corrective Action

- Replace the water level sensor, item J.

Humidifier does not drain and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- During a Drain or Foaming cycle, the water level sensor has sensed that the water level has not decreased.

Corrective Action

- Verify that the drain pump, the fill and drain water pipe connection, the water level sensor chamber are not obstructed.

Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- The high temperature switch has detected abnormal temperature.

Corrective Action

- Verify if the humidifier was operating below the standard water level.
- Replace item J water level sensor, if necessary.
- Press the manual reset to close the Klixon.

Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- The internal 24vac of the humidifier is shorted.

Corrective Action

- Verify the internal wiring and connections.
- Replace the fuse.

Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- The external 24Vac provided to the humidifier is shorted.

Corrective Action

- Check the external wiring.

Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- The water level sensor or the cooling fan is shorted.

Corrective Action

- Verify the connection of water level sensor and cooling fan.
- Replace the water level sensor (item J) or the cooling fan (item Q), if necessary.

Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

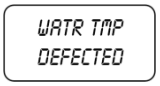
Cause

- Time lapse between two refills is too long when the humidifier is producing steam.

Corrective Action

- Verify the water level sensor and water level chamber and clean, if necessary.
- Reset the Alarm. See Alarms.

Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- Water temperature is defective.

Corrective Action

- Verify the connection the to water level sensor.
- Replace the water level sensor item J, if necessary.

Humidifier does not operate and the CHECK light is ON

Indicator	Status	Display
Power	ON	
Check	ON	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- The temperature on the SSR is too high.

Corrective Action

- Verify the cooling fan is operational and the air vents are free of dirt.
- Replace the cooling fan (item Q), if necessary.

Humidifier does not produce steam

Indicator	Status	Display
Power	ON	
Check	OFF	
Fill	OFF	
Steam	OFF	
Drain	OFF	

Cause

- The interlock contact is open.

Corrective Action

- Check the interlock switch.
- Verify the wires to the control terminal blocks #F & 5.

Notes

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